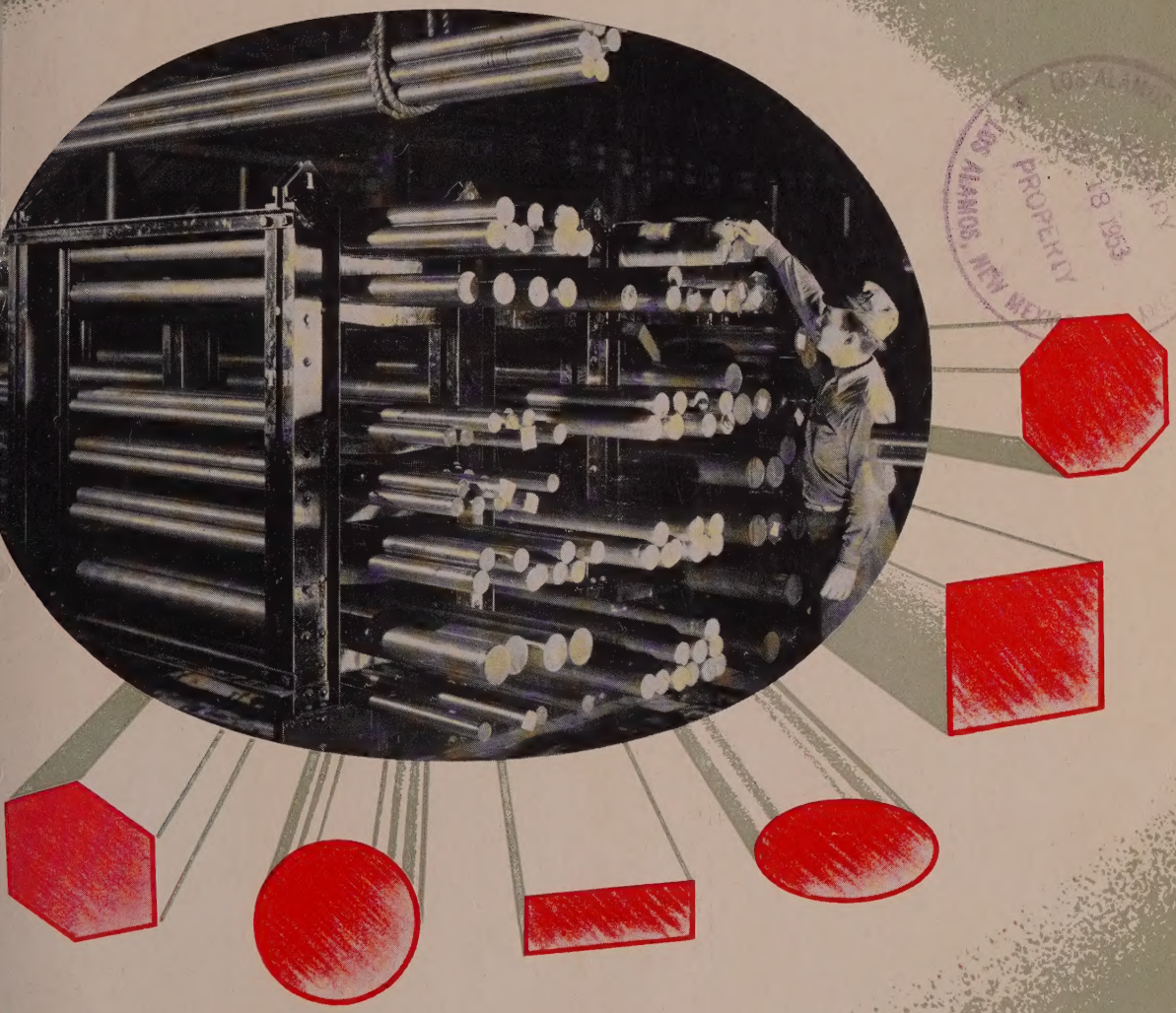
SEPTEMBER 14, 1953

STEEL

THE WEEKLY MAGAZINE OF METALWORKING



LOS ALAMOS SCIENTIFIC LABORATORY
PROPERTY
LOS ALAMOS, NEW MEXICO

OIL & GAS EXPANSION
Booms Metalworking, p. 63

MOVIES IN THE PLANT
They Spot Production Waste, p. 158

Selecting Carbon Steel Bars

Points you'll want to consider in choosing the right grade and type for the job are set out on p. 104

Don't despair if you can't get the bars you want. They'll soon be easier to get—p. 74

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STRIP STEEL

ALL gauges . . . tempers

IMMEDIATE DELIVERY

from Warehouse stocks

COILS OR STRAIGHT LENGTHS . . . ready for immediate delivery in whatever quantity, gauge or temper you need. As an *extra* service to save you time and money, Korhumel has complete facilities for cold reducing and bright annealing of coils. For delivery tomorrow call your Korhumel Sales Engineer today.

STEEL
- Cold and Hot Rolled Strip and Sheet
- Spring Steel, Tempered and Annealed
- Feeler Gauge
- Round Edge Flat Wire
- Shim Steel
- Electro Galvanized
- Electrical Sheets
- Tin Plate
- Cold Finished Bars
- Tubing, Seamless, Welded
- Rigidtex Stainless Hydraulic Tubing

ALUMINUM
- Strip and Sheet Coils
- Straight Lengths
- Bars

PHOSPHOR BRONZE
- Coils and Flats

SERVICES
- Slitting
- Shearing
- Edge Rolling
- Bright Annealing
- Cold Rolling
- Ungerer Roller Leveling

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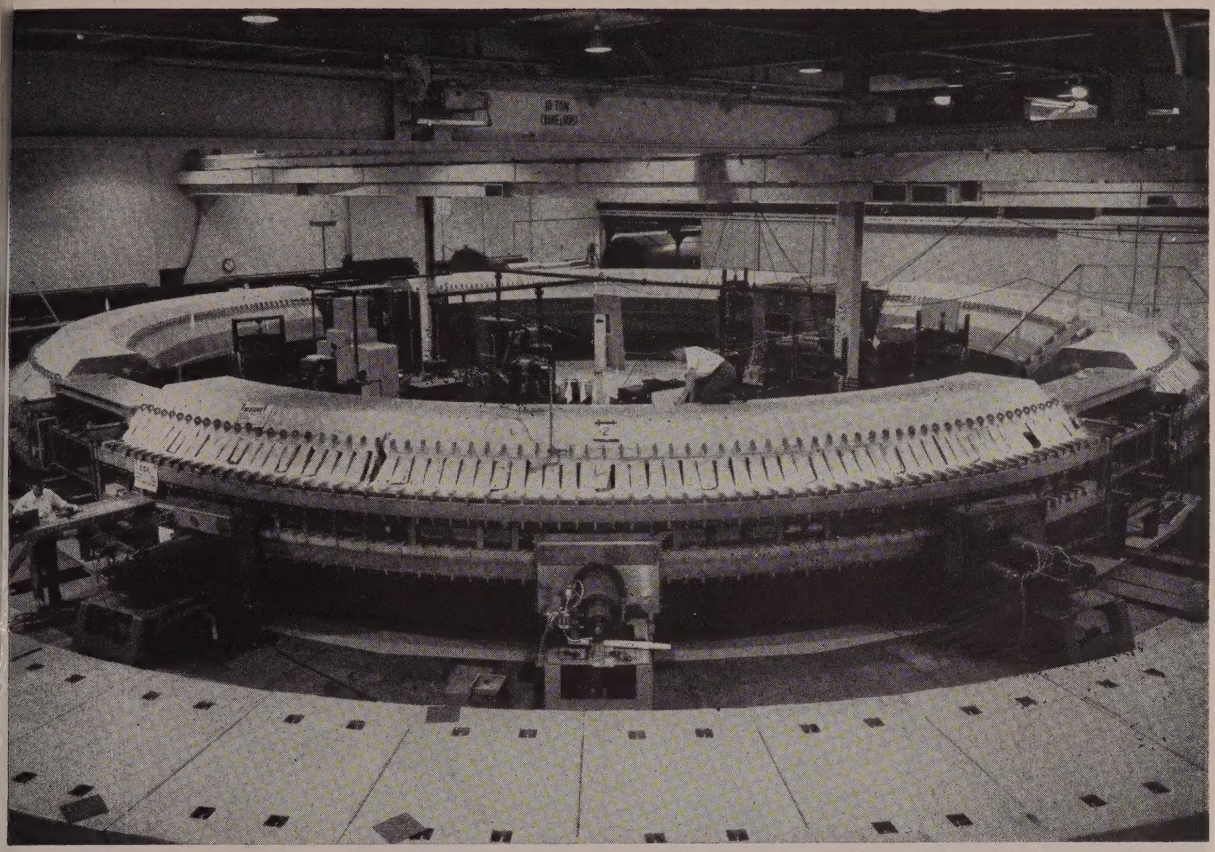
1943 10 YEARS OF WAREHOUSE PROGRESS BUILT ON SERVICE **1953**



One of principal elements in Cosmotron is huge magnet, consisting of 288 octagonal blocks, flame-cut and welded by Bethlehem. Wall in foreground, made up of concrete blocks, protects personnel from high-energy nuclear particles when machine is in operation.

Welded Steel Blocks Used in Building Largest Atom Accelerator

This is the world's largest atom accelerator. It is called the Cosmotron, and it is located at the Atomic Energy Commission's Brookhaven National Laboratory, at Upton, N. Y.

The Cosmotron makes available bombarding particles of hydrogen with an energy of from 2 to 3 billion electron volts, to create new particles known to science as mesons.

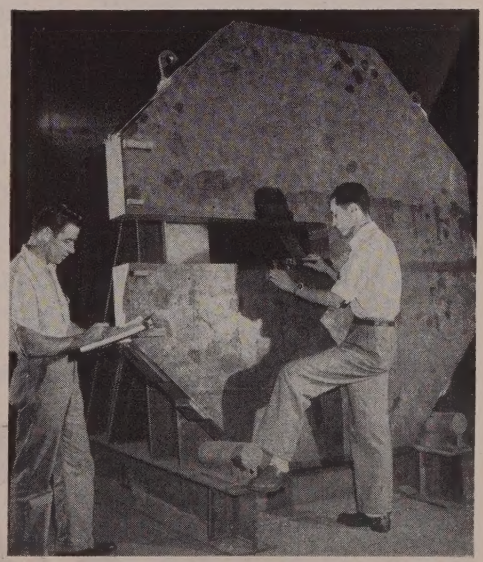
An important component of the Cosmotron is the huge electromagnet, about 75 ft in outside diameter, and weighing 2200 tons. It is designed to whirl the atomic particles around its periphery about 3 million times a second.

The magnet is a circular assembly consisting of 288 octagonal blocks. These blocks are made up of 12 octagonal plates, each ½ in. thick, and separated by insulating fibre. In rectangular slots, flame-cut in these plates, rests the vacuum chamber through which the atomic particles are whirled.

The blocks were made in Bethlehem's Weldments Shop, at Bethlehem, Pa., and shipped to Brookhaven, where Bethlehem engineers assembled them to form the complete magnet.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

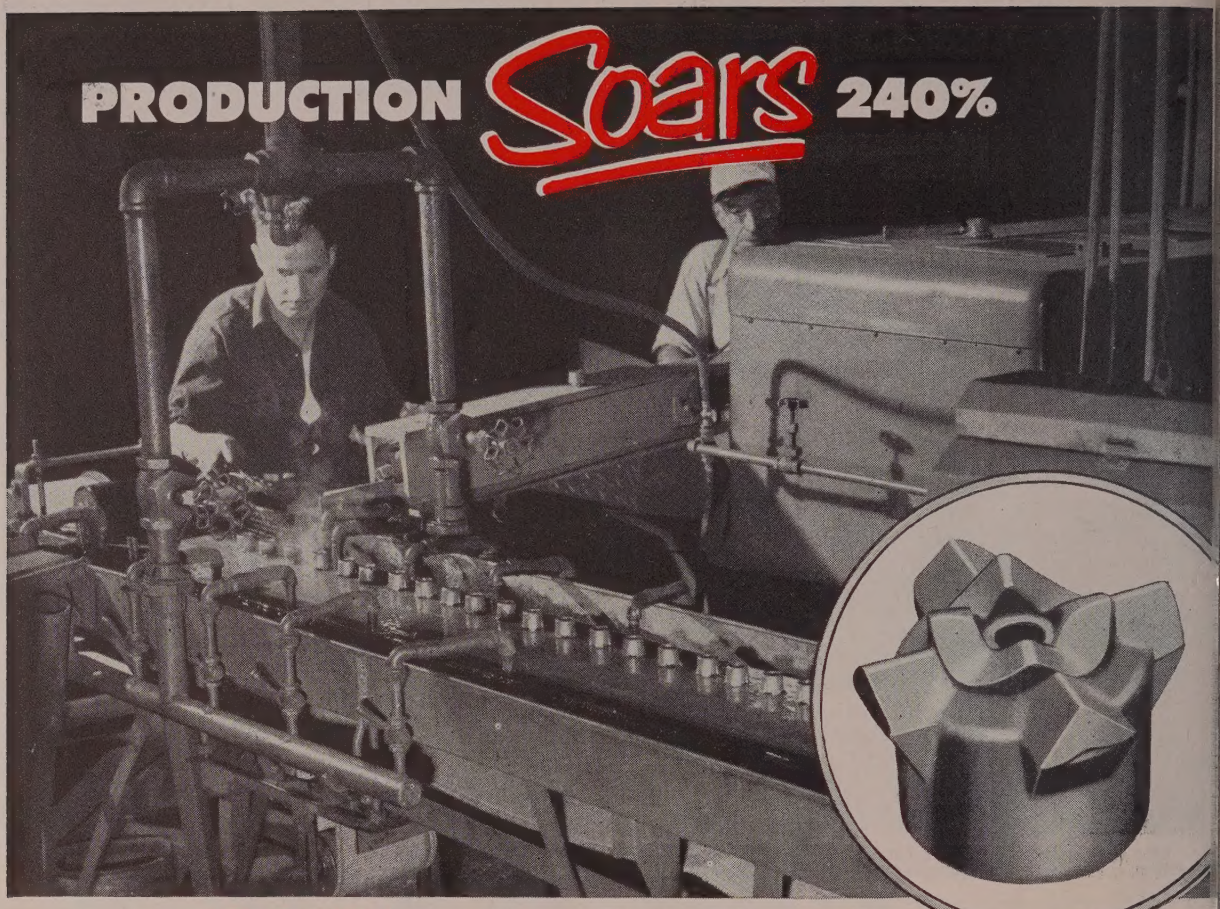


Octagonal block for Cosmotron undergoing inspection in Bethlehem's Weldments Shop.

BETHLEHEM STEEL

BETHLEHEM WELDMENTS

PRODUCTION Soars 240%



with TOCCO* Induction Heating

PRODUCTION UP. When Thompson Products Ltd., St. Catharines, Ontario switched from conventional hardening methods to TOCCO Induction hardening production of their mine drill bits increased from 250 to 600 per hour!

COSTS DOWN. While production skyrocketed, costs fell—from $7.46 per hundred parts to $6.50, a savings of almost exactly one cent per part on the hardening operation alone.

OTHER ADVANTAGES. Moreover, additional savings resulted from not having to haul the forged drill bits to and from the heat-treat department. Cool, clean TOCCO fits right in the production line—takes only ¼ the space of rotary hearth furnace previously used.

In Canada or United States TOCCO Engineers are glad to survey your operations for similar cost-cutting results—no obligation, of course.

This Mine Drill Bit is made of .90 carbon drill steel. Cutting face is hardened to 65 R. C Thompson also uses TOCCO to heat stock for forging these parts.

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*Trade Mark Reg. U. S. Pat. Off.

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Dept. S-9, Cleveland 1, Ohio

Please send copy of "Typical Results of TOCCO Induction Hardening and Heat Treating".

Name_____

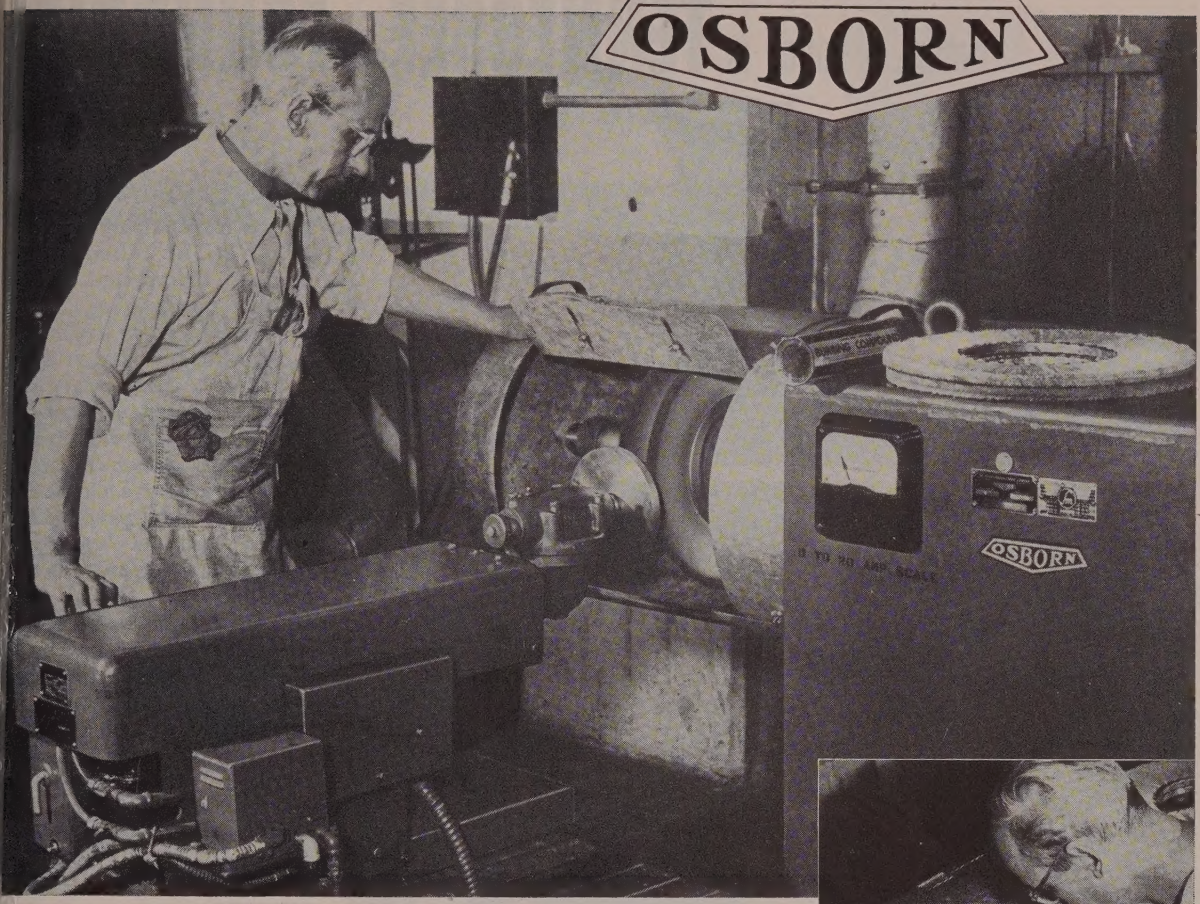
Position_____

Company_____

Address_____

City_____ Zone____ State_____

OSBORN



Burr removal time cut 50% with push-button brushing

plus greatly improved quality

Power Brushing of transmission gears removes burrs and blends surface junctures automatically. It has paid off 5 ways for a large East Coast manufacturer of aircraft parts.

Their Osborn Brushing Machine produces a uniform required rounding of .030″ to .090″. It accommodates gears and splines of most types, internal and external. It is easy to adjust for small gear lots and production runs of from 15 to 5,000 pieces. It eliminates costly scrap. *And* less effective hand method time was cut almost 50%.

Production bottlenecks and ineffective finishing departments in *your* plant can be reduced, often eliminated, with Osborn Power Brushing methods.

Find out how you can cut *your* costs . . . improve your workmanship. For new bulletin, Automatic Deburring, call in your nearby **O**sborn **B**rushing **A**nalyst for complete information, or write *The Osborn Manufacturing Company, Dept. G-10, 5401 Hamilton Avenue, Cleveland 14, Ohio.*

Operator can set up in a few minutes. Work is power rotated against the face of the brushes. A pre-set timer controls length of the cycle and retracts the holder.

Old method of hand burr removal was inaccurate, costly and time-wasting.

Osborn Brushes

SBORN POWER, MAINTENANCE AND PAINT BRUSHES AND FOUNDRY MOLDING MACHINES

THERE'S A TOUCH OF TENNESSEE IN FOUNDRIES

Here is more precisio and efficiency for foundr operations in the form o TENNESSEE Silicon-Man ganese Briquettes. Thes cubes, containing exac quantities of silicon an manganese, make it eas to control accurately th alloy content of cupol charges. No weighing i necessary..each briquett contains one-half poun of silicon and two pound of manganese. Just coun 'em to suit the charge an toss 'em in.

For the foundry field TENNESSEE also produce Ferro-Silicon and Ferro Manganese in lump, crush ed and briquette forms. Tenn-Sil additive for mold ing sand..low-phosphoru and malleable pig iron. all keys to lower costs an improved products.

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Corporation
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This Week in Metalworking

STEEL

Vol. 133 No. 11 September 14, 1953

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Men of Industry 85
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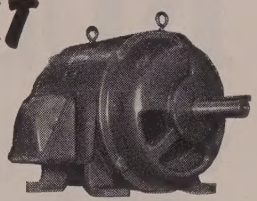
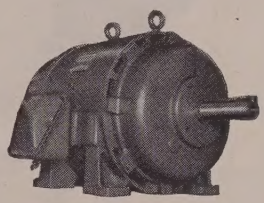
RELIANCE *Precision-Built* MOTORS

BUILT



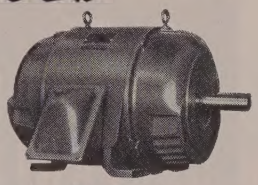
Protected Open

FOR



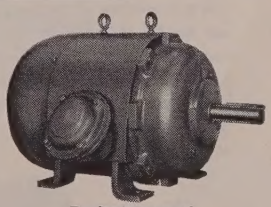
Totally-enclosed, Fan-cooled

RUGGED



Splashproof

SERVICE



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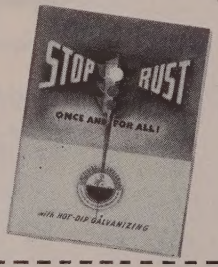
Send your iron and steel products to a member of the American Hot-Dip Galvanizers Association. His years of experience plus collective know-how assure you of a top quality job—if it's iron or steel have it Hot-Dip Galvanized.



Send for Free Booklet

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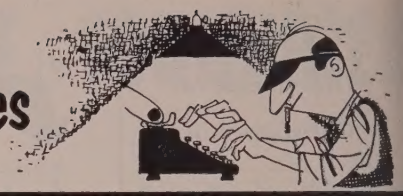
Print
Name_____
Firm_____
Address_____
City_____ State_____

behind the scenes



6,937 New STEEL Subscribers

We were nosing around in the circulation department the other day and caught Rand Ebersole, circulation manager, massaging the keyboard of a calculator as if it had low back pains.

There was an Omar Khayyam-ish look on Rand's face—almost as if he had downed the jug of wine in one swallow—so we sidled over to him and asked in our most casual manner, "What gives, Nibbs?" (That's current teen-age jargon for "what cooks, Snooks?")

"Just countin' the past year's crop of new STEEL subscriptions" answered Rand with assumed nonchalance.

"That so?" we reparteed brilliantly.

"Yep!" came his rapid rejoiner. "There are 6,937 new metalworking executives in our growing family and our total circulation rose to 35,000 copies effective with the September 7 issue. That's an all time high."

"Wonder how many of those fine folks read this column?" we mused. "Wonder how many of those who do will renew their subscriptions next year?"

Spares and Strikes

There's an air of intense excitement in ye olde Penton paper mill these days. Long-time friends and associates wear looks of guarded anxiety as they meet one another in the elevator . . . in the corridors . . . or in the lunchroom.

Reason for this high-tension atmosphere is, of course, the opening of the Penton Bowling League competitions this week and a body just doesn't know who is friend or foe. Team assignments will be announced in a few days and each of the sixty would-be keglers waits in suspension to see what five people he will be talking to this season. Competition gets pretty intense we are told. Rumor has it that one bowlerina walked up eight flights of stairs rather than ride in the elevator of an operator whose 200-game nosed out her team in a hotly contested match. And then there's the editor who insidiously wrote all his headlines in the passive voice just because his managing editor picked up an 8-10 split to nip his team in a close one.

We are happy to report that all precautions are being taken to see that STEEL editors and Penton Press representatives stay on the friendliest of bowling terms so that they can continue to combine their talents to bring you the STEEL you love so well.

We want no pied type here!

Marital Problem Solved

Our problem of August 31 brought four very quick but only three very right answers. George E. Dunn, George W. Frederick, and L. D. Rice, three of our most prolific puzzlers, were correct in their deductions that Bernard was married to Barbara, Charles to Ann and Arthur to Cynthia.

The very quick but not quite right Miss Charlsie Burch of Granite City's General Steel Castings was our third respondent at the time of this writing.

Incidentally, we want to thank Miss Burch for the very clever sketches with which she decorated her letter. We think Ann and Cynthia are quite goodlooking but a wee bit underweight.

Puzzle This One Out

This issue's problem is an original submitted by Mr. Robert Lubinski, industrial engineer at the New York Naval Shipyard.

Two men start walking toward each other at uniform speeds from two diametrically opposite points on the shores of a circular lake. They meet first at a point one mile from one of the starting points.

Without stopping, they pass and continue walking until they again meet at a point one and one quarter miles from the other starting point. What is the diameter of the lake?

Shrdlu

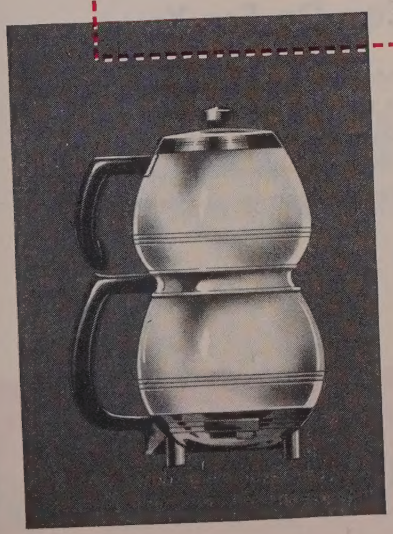
(Metalworking Outlook—page 55)

products that must have

Eye appeal...

HERE'S THE STAINLESS WITH THE FINISH . . .

SHARON STAINLESS STEELS



A special patented steel finishing process, developed by Sharon metallurgists gives to Sharon Stainless Steels a "buffability" unmatched in the industry. Those who have compared stainless finishes after buffing know, that when it comes to finish, Sharon Stainless has no equal.

So, if you're thinking of product improvement and considering the use of Stainless Steels why not get the finest . . . . specify Sharon Stainless Steels. Technical information and fabrication help upon request.

There are Sharon offices located in Chicago, Cincinnati, Cleveland, Dayton, Detroit, Indianapolis, Milwaukee, New York, Philadelphia, Rochester, Los Angeles, San Francisco, Montreal and Toronto to better serve your needs.

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Sharon has prepared a fact-packed, fully illustrated booklet with up-to-the-minute information about 430 Stainless Steel. To get your free copy contact your nearest Sharon representative or write direct to **Sharon Steel Corporation — Sharon, Pa.**

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America's Largest Producer o

Record of Achievement
IN THE DEFENSE PROGRAM

During the current Defense period Standard Steel Spring Company is proud again to serve as the key producer and coordinator for a vast armor plate program. The request by the Government, that we assume this challenging task resulted from a similar assignment during World War II, on which we compiled an outstanding production record.

Starting from scratch in November 1950 we screened a multitude of plants and from them selected a sufficiently large number of qualified manufacturers to join forces with us in this endeavor. To these subcontractors we have given freely of our special talents in engineering, metallurgy, tooling and manufacture. From our armor plate headquarters, centrally located in Detroit, we guide the activities of those associated with us, while working closely with procurement, scheduling and inspection.

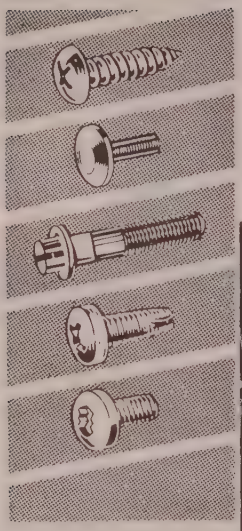
As a result of these coordinated efforts a huge tonnage of armor plate has been supplied to all major tank manufacturers—*more than that of any other producer.*

This is our way—the American way—to combine "know-how" with teamwork and build armored might. From it is fast coming an awesome arsenal of defense to withstand and repulse any who may challenge this peace-loving country in the future.

Standard Steel Spring Company

ARMOR PLATE DIVISION • PENOBSCOT BLDG. • DETROIT, MICHIGAN

ARMOR PLATE for Ordnance



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The excellent grain flow properties of this wire assures the desired upsetting and die forming qualities you need for greater efficiency in your particular operation.

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LETTERS
TO THE EDITORS

Traffic Story Impressive

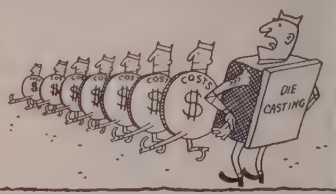
This is the first time in many yea that I have had occasion to write yo but now it ought to be done.

Mr. Samuel W. Baker's article "Tra fic Control" (Aug. 31, p. 40) strikes r as being a good and impressive job a one which needed doing. Mr. Bak chose a good man to write about a I think that his choice of an indust other than heavy steel was good, too, b cause it is often rather easy to see t vital importance of transportation wh prices are relatively low and tonnag are exceedingly high.

In the field of transportation we know of Mr. James B. Griffin's wo and his success.

Andrew H. Bro
transportation commissio
Cleveland Chamber of Comme
Clevel

Keep Costs in Line



As a manufacturer's agent we seld find time to read business magazines our own time, but the same as ot salesmen we find quite a bit of read time while waiting for our intervie I usually manage to find STEEL in group provided for salesmen so I seld miss an issue. In the July 6 issu read the article "Let Die Castings H Keep Costs in Line" (p. 106) and h ing die castings in my line I was p ticularly interested.

This article appears to be one of most comprehensive I have read on subject and I would like to pass it to some of my potential customers. H may I obtain several tearsheets?

W. O. Kjel
K & K Sales
St.

• *Tearsheets are on the way with compliments.—ED.*

One for the Buyer's Guide

Can you furnish us with the name possible sources for .001-inch thick st less steel strip 10½-inches wide?

H. M. Isaa
Methods Engineering
Rudolph Wurlitze
North Tonawanda,

• STEEL *distributed a "Guide for St less Steel Buyers" with its June 22 sue which was a comprehensive lis of types and sizes of stainless made by mills in the U.S. The g shows there is only one mill that m extra thin stainless steel in the w*

Please turn to page 12

Everywhere you LOOK..

INSUL-MASTIC Coatings Provide Long-Lasting Protection

Practically everything in the blast furnace area seen above is coated with INSUL-MASTIC, to prevent corrosion.

This is the way that one large steel mill assures long life for its equipment. Some of the structures pictured have been coated for five years without maintenance, and there will be a great many more years of protection.

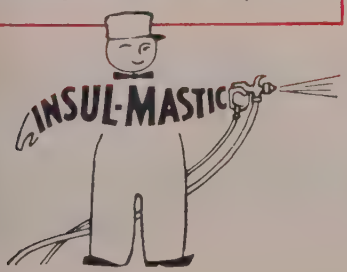
INSUL-MASTIC prevents corrosion in this and many other steel mills in spite of an almost constant rain of acid vapor from coke quenching operations. These coatings very capably resist corrosive chemicals and stop moisture penetration. That is the purpose for which they are made. They are also unharmed by sunlight and weather, a failing point of many coatings.

INSUL-MASTIC coatings resist abrasion yet are flexible enough to stand expansion and contraction of vessels without cracking. They have a temperature range of −40°F to +300°F.

Let these coatings reduce your maintenance operations and extend the life of your equipment. Write today for the address of your nearest INSUL-MASTIC representative.

Think first of the coatings that last!

TAKE ADVANTAGE OF OUR CONSULTANT SERVICE. Don't risk needless future maintenance. Our engineers can tell you whether or not your construction or insulation needs a protective coating. There is no obligation. Write today!



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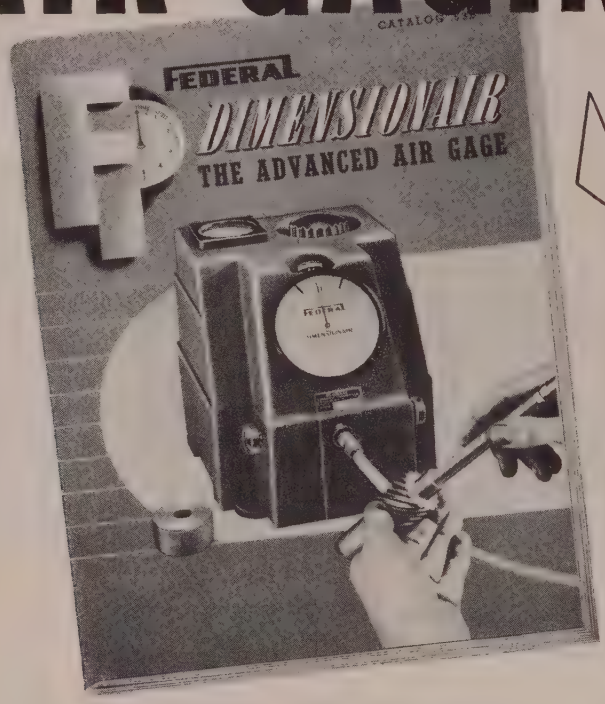

JUST OFF THE PRESS, this book contains up-to-the-minute, complete specifications for the Dimensionair. It explains the important advantages of the new balanced air system. It also tells about our entirely new air gage accessories — the Arnold Air Gage, Air Electric Switch, and Air Gaging Electronic Controls. You will also find useful tables showing plug, ring, and air snap sizes available from stock. Here, conveniently available in one attractive catalog, is a fund of the latest authoritative reference data on the Air Gage, developed by Federal during many years study of actual shop use requirements and engineering research. Ask for your copy today and profit from this valuable new book.

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Company .....

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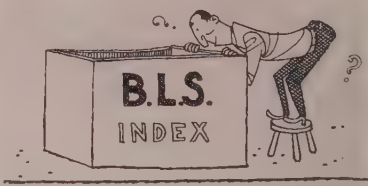
LETTERS

Concluded from page 10

you desire. It is the Armco Steel Corp. mill at Butler, Pa.—ED.

What Goes Into BLS Index?



Please send complete description of products, extras and deductions applicable to them of the products listed in List No. 1 of Aug. 17 issue of STEEL, p. 180. Also send explanation of weighted index and of arithmetical price composite.

J. W. Mantooth
purchasing agent
Differential Steel Car Co
Findlay, O

• *The description is enroute along with clippings from previous issues of* STEEL *that explain* STEEL's *weighted finished steel price index and arithmetical price composites.—ED.*

Would you kindly forward the complete description to us . . .

C. E. Youngberg
Eimco Inter-America Inc
Salt Lake City, Utah

• *Sent.—ED.*

Bright Dip Query

In the "Production and Engineering News at a Glance" section, STEEL, June 29, p. 87, you ran an article about "Steel Bright Dip." Please advise where detailed information on this subject may be obtained.

H. J. Pessl
assistant works manager
Gibson Refrigerator Co.
Greenville, Mich

• *Bright Dip, known as Mirrofe, for steel parts was developed by McDermid Inc., Waterbury, Conn. We suggest that you write to Mr. Harold Leever, president of the company.—ED.*

Fight Corrosion

Please forward reprints of articles appearing in STEEL as follows: "Fight Corrosion" by Dr. Allen G. Gray, Apr. 6; "Liquid Blanket Reduces Oxidation of Molten Zinc" by A. A. Paterson, Apr. 13, 1953.

H. L. Schmidt Jr
laboratory supervisor
Haviland Products Co
Grand Rapids, Mich

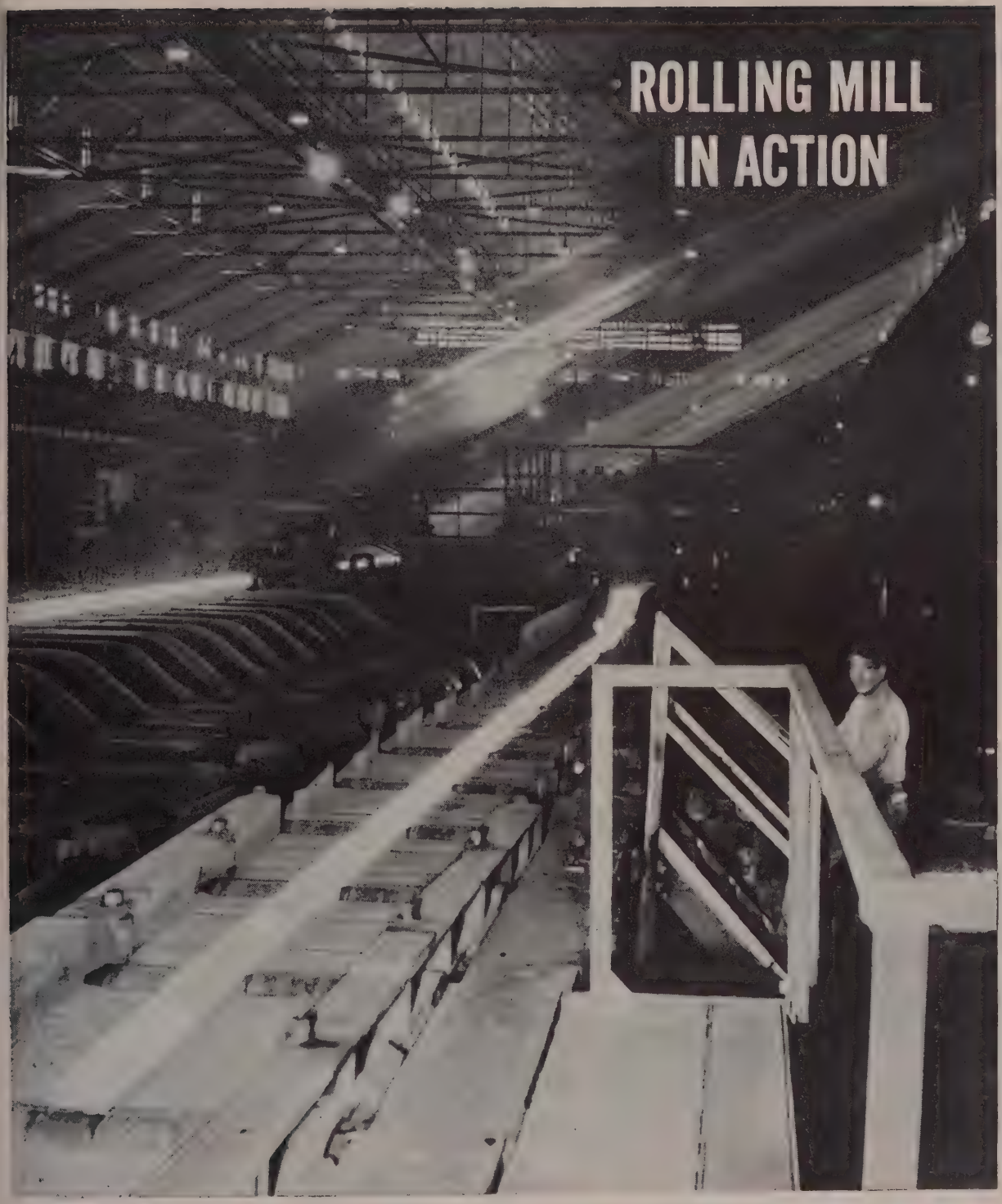
• *Sent.—ED.*

Warehouse Orders a Dozen

We are interested in the article appearing under the title "Warehouses Offer Plus Service" (July 13, p. 67). We would like to have 12 additional copies of this article.

S. A. Shander
Athos Steel Service
Philadelphia

• *Sent.—ED.*



WISCONSIN STEEL COMPANY

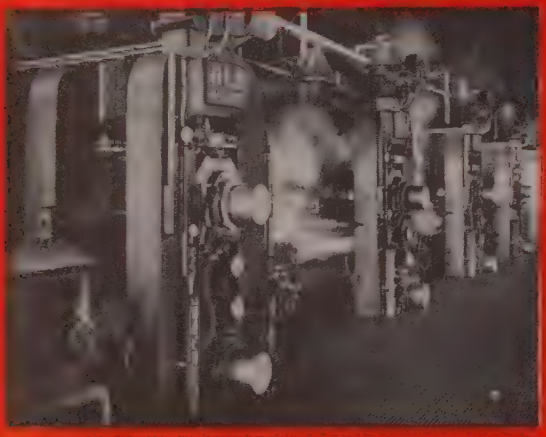
AFFILIATE OF INTERNATIONAL HARVESTER COMPANY

INTERNATIONAL HARVESTER

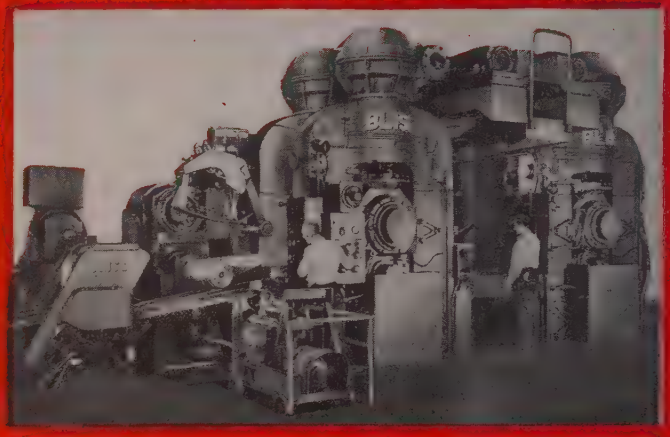
180 NORTH MICHIGAN AVENUE, CHICAGO 1, ILLINOIS

Whatever your metal-rolling job...

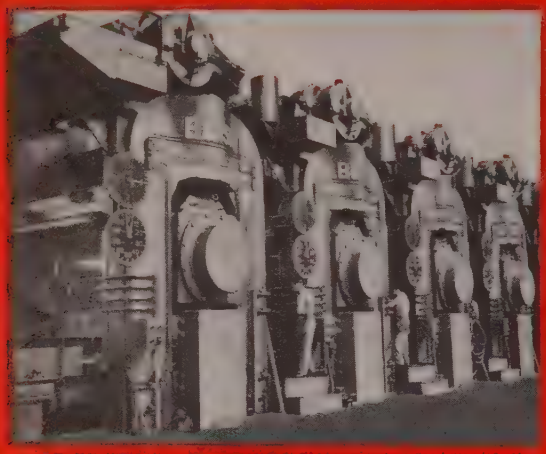
Hot..... Cold..... STEEL..... BRASS..... ALUMINUM.....



HOT-ROLLING STAINLESS · A Bliss 24″, five-stand hot finishing train handles all the hot-rolling of stainless and "specialty" steels at Superior Steel Corporation. Since the thin stainless is slit into narrow strips, extreme accuracy and flatness are vital.



BRASS TANDEM · Brass and copper breakdown is the job of this Bliss four-high, two-stand tandem strip mill at the Springdale, Conn., plant of Stamford Rolling Mills Company. Bliss coiler, at far left, coils flat bars. Tension reel winds lighter-gage coils. A coil mandrel and elevator permit quick handling of heavy-gage coils.



HOT-ROLLING ALUMINUM · This five-stand, four-high 80″ tandem mill hot-rolls aluminum sheet strip. Engineered and supplied complete by Bliss for a leading aluminum producer, this mill includes all necessary special auxiliaries such as roll brushers, guides and up coilers.

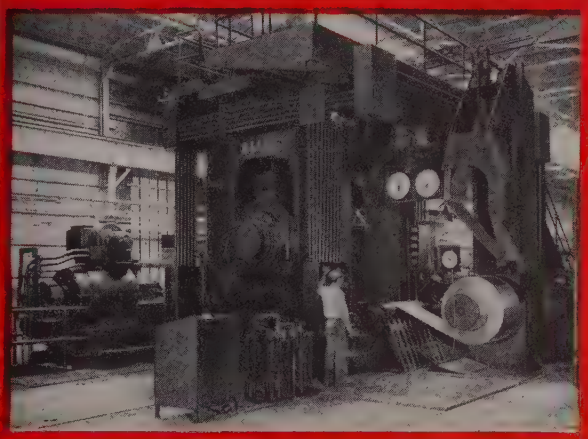
UP-CUT SHEAR LINE · Coiled steel is converted into uniformly flat sheet blanks at speeds up to 240 fpm by this shear line, designed by Bliss for Alan Wood Steel Company's 30″ hot mill. The Bliss continuous shear line performs nine operations—from feeding to piling. It is suited for use in steel, brass and copper mills or fabricating plants.

Remember:

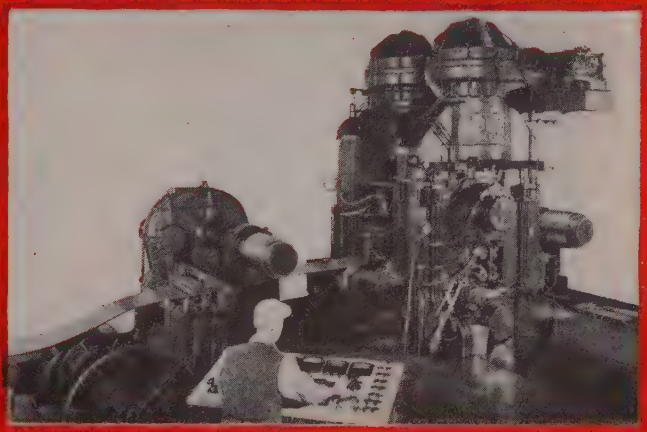
for Presses, ROLLING MILLS...

there's a BLISS mill to do it

.....Breakdown.....Rundown.....Finishing.....



STEEL TEMPER PASS · Bliss four-high temper-pass mill, installed at the South's leading steel plant, rolled a record tonnage of steel in eight hours. Here, it tempers 20-gage steel at 3500 fpm; handles 30- to 13-gage, 20″ to 48″ wide. It handles sheet stock coils up to 72″ in diameter



FOUR-HIGH REVERSING · This four-high reversing cold reduction mill, specially designed by Bliss, proved to be the answer to the Greer Steel Company's "varied" requirements—a rugged, versatile mill to maintain exacting standards for quality of finish and accuracy of gage on short runs and quick changeovers.

COLD-ROLLING STAINLESS · The steel plant for whom Bliss built this three-stand, two-high mill reports a 50% average reduction in a single pass; accurate cold-rolling and finishing of stainless and special alloys within .0005″ overall; 'round-the-clock operation at speeds up to 600 fpm.

For many, many years, the world's major metal-producing plants have specified Bliss rolling mills. Built for precision work at maximum speeds, Bliss mills take the abuse of continuous, high-speed operation with least possible maintenance.

Bliss builds a complete line of rolling mills and accessories for hot or cold rolling of ferrous or non-ferrous metals. Whatever your metal-rolling problem, you can look to Bliss for the right answer. Take the first step by writing for the Bliss 52-page brochure, including an extensive range of rolling mill machinery and many useful pages of engineering tables.

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ROLLING MILL DIVISION: SALEM, OHIO

Branch offices in Chicago, Cleveland, Dayton, Detroit, Indianapolis, New Haven, New York, Philadelphia, Rochester, Toledo; and Toronto, Canada. West Coast Representatives: Moore Machinery Co., Los Angeles and San Francisco; Star Machinery Co., Seattle. Other dealers in United States cities and throughout the world.

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7 Adjustments can be "locked in"—hundreds of parts precisely duplicated.

8 Long, trouble-free service, all machines backed by warranty.

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10 Delivery is good. Cost is too.

*pronounced Die-ack-ro

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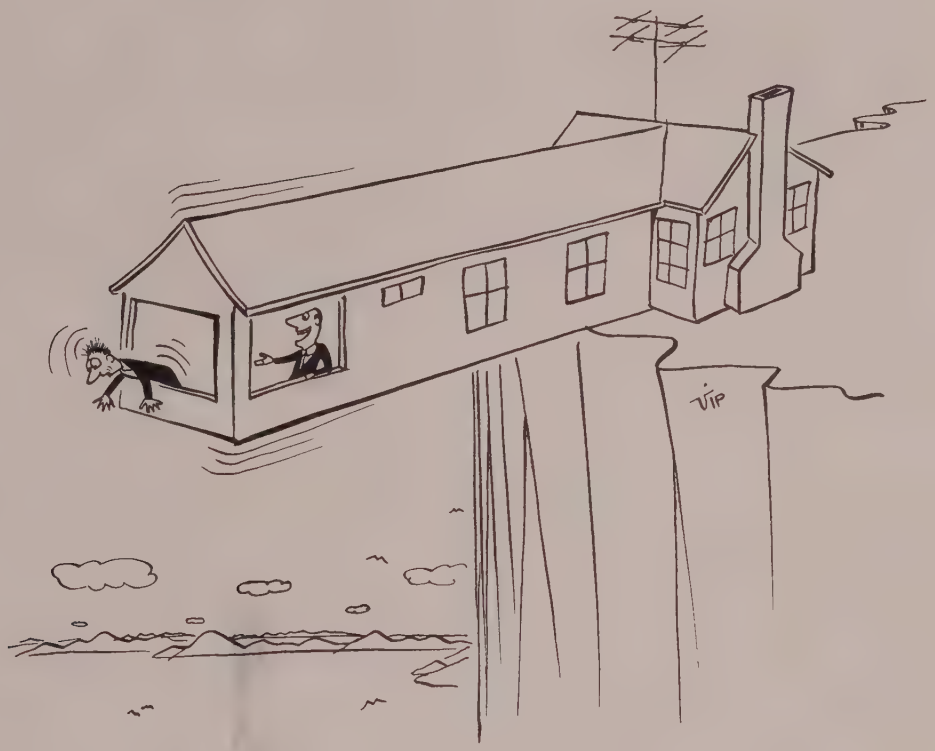
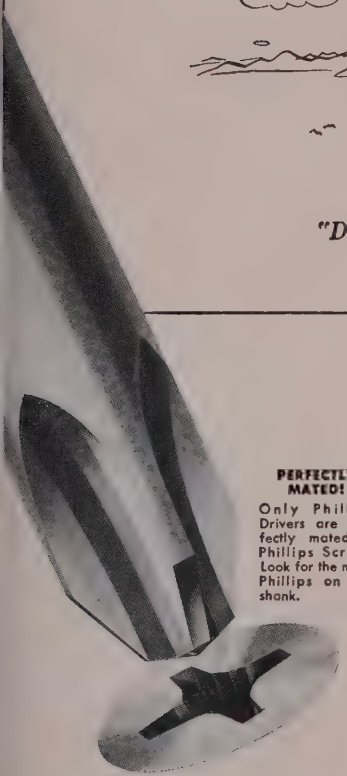
by Phillips



"Don't let it worry you. Everything is made fast with Phillips Cross-Recessed-Head Screws."



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Only Phillips Drivers are perfectly mated to Phillips Screws. Look for the name Phillips on the shank.

VIBRATION RESISTANCE because of added structural strength is only one of the exclusive advantages gained by using Phillips Screws. These screws set up tighter and their distinctive design gives them maximum strength of head. And that's not all. Because they are unusually easy to drive, they cut driving time up to 50%, eliminate driver skids and split screw heads. You save time, work, money when you use Phillips Screws — Wood, Machine, Tapping Screws or "Sems."

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For rebuilding or repairing coke ove

you can count on Koppers

● Koppers has designed and erected a great many coke-oven plants similar to the one shown here. In fact, the constructing of new coke ovens represents a major part of our services to the Iron and Steel Industry.

However, what may not be as well-known are the services we are bringing to bear on the coke-oven repair and rebuilding projects that are now assuming increasing importance in the programing of many companies.

For such projects, we extend to you the same scope of engineering skills and experience, the same meticulous adherence to the client's best interests, the same ability to engineer economies and superior performance into the finished job that have characterized our work on new construction.

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Constructing, rebuilding or repairing coke ovens is just one way in which Koppers serves the steel industry. For any kind of metallurgical construction, you can count on Koppers.

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Engineering and Construction Division

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M & T WELDING CABLE* is built to *give* maximum flexibility—*take* severe handling and service conditions. . . . Its tough, resilient NEOPRENE cover resists attack of oils, acids, alkalies, sunlight, heat and abrasion—provides easier flexing for more convenient and efficient operation. . . . Conductor is composed of many carefully stranded, fine, soft annealed copper wires—thin paper separator protects conductor strands and simplifies jacket stripping when making connections.

For more particulars on this improved welding cable—and an outstanding line of power cable, too—contact your distributor or nearest M & T office.

**Meets A.S.T.M. Specification D-752 (Neoprene sheath for heavy-duty service).*

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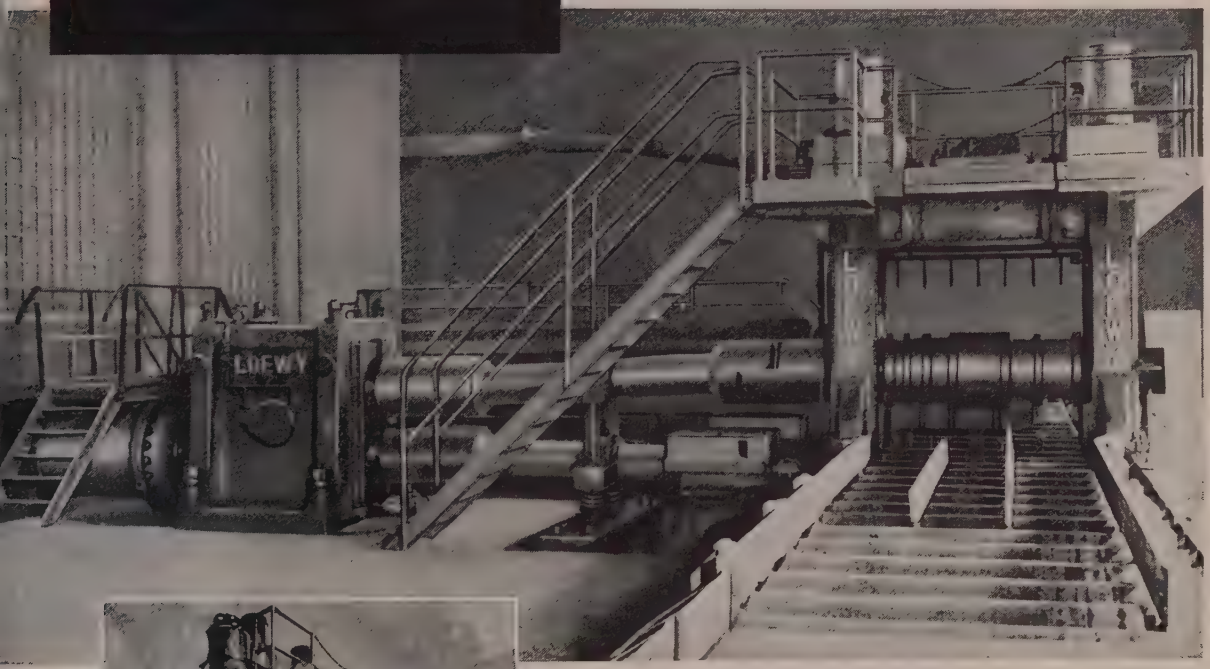
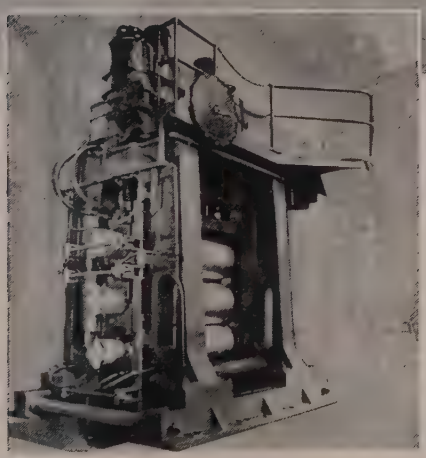
Below:
26" Two-high Blooming Mill, part of a complete Blooming, Slabbing, Structural and Strip Mill Installation.





Left:
26" Three-high Blooming Mill Stand, part of a complete Blooming, Slabbing, Structural, Wire Rod and Strip Mill.

LOEWY-HYDROPRESS ROLLING MILL DIVISION

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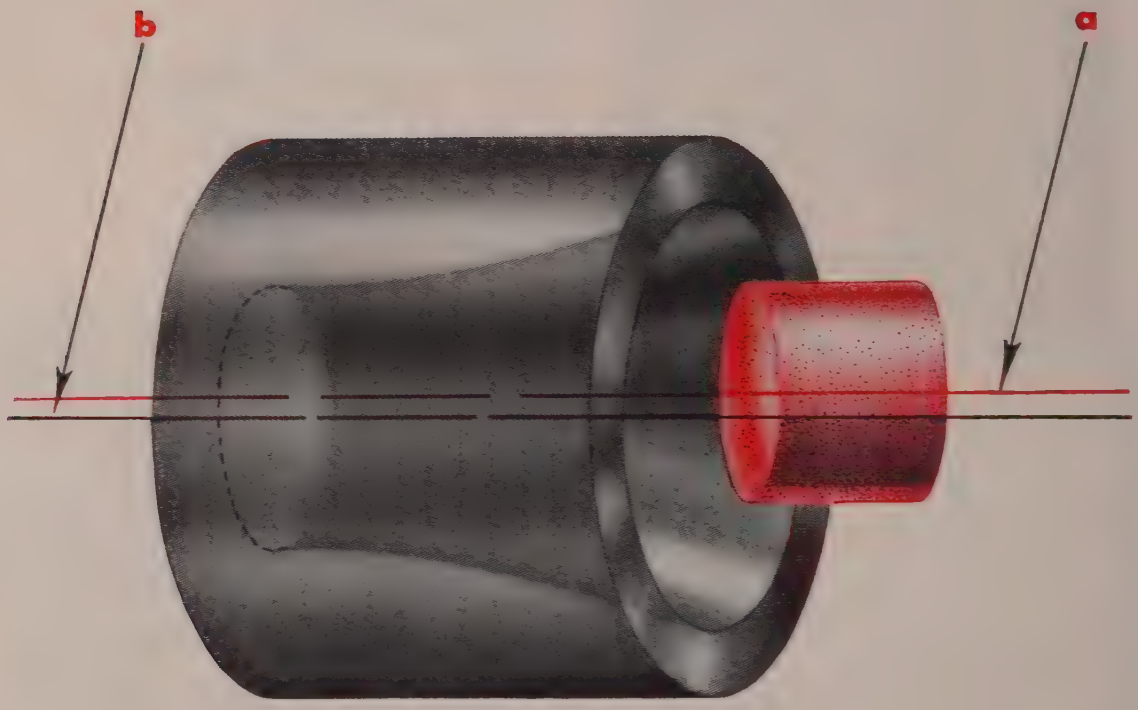
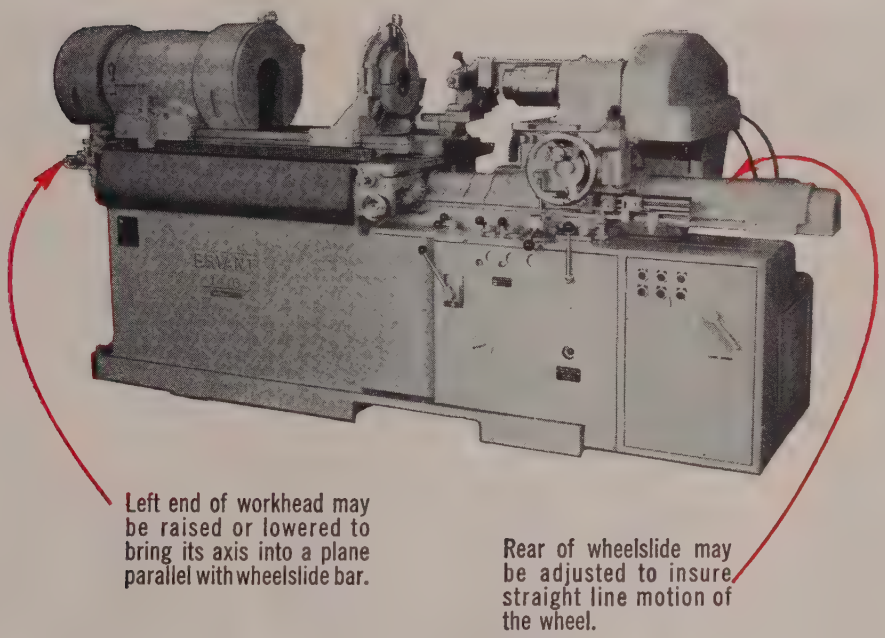
alignment

for better internal grinding



TO GRIND a taper, the internal grinder must be set up according to simple geometric principles; that is, the path of the grinding wheel must be a straight line and must intersect the axis of the workpiece at a point. In the illustration, the axis of the wheel path "a" and the axis of the work "b" lie in parallel planes. The axes cross, but fail to intersect. Under these conditions, it is impossible to grind a true taper. As the grinding wheel enters the large end of the taper, the point of contact is high. This end of the taper can be ground to size. As the wheel progresses through the hole, the contact moves even higher, with the result that the hole will be progressively oversize and a curve is generated instead of a uniform taper.

A taper ground under these conditions probably will blue only in the middle. Turning the workhead may shift this plug contact but, as the wheel wears, the plug contact will continue to move. The remedy is to correct alignment so the wheel path and wheel axis "a" and the work axis "b" intersect and lie in a plane which includes the diamond. Then a uniform taper will be generated. In shop practice the adjustment would be made by bringing the wheel and work to exactly the same center height.


Left end of workhead may be raised or lowered to bring its axis into a plane parallel with wheelslide bar.
Rear of wheelslide may be adjusted to insure straight line motion of the wheel.

This semi-automatic machine is for grinding bores in long parts and is adaptable for either production or tool room work. It will swing work up to 16″ and grind bores up to 9″ depth. The work is held in a standard hollow work spindle and steadyrest. The workhead may be adjusted longitudinally over a distance of 37″ to meet the requirements of a large variety of work. It may be pivoted for grinding a taper up to 30° included angle. Hydraulic operation provides a wide range of traverse speeds. Write for folder.

Bryant Chucking Grinder Company

Springfield, Vermont, U. S. A.

Internal grinders • *Internal & External thread gages*

Acme Steel Strapping Insures S.A. *(Safe Arrival)*

Saves time and trouble palletizing automobile bumpers

BUMPER-TO-BUMPER. Each multi-bumper unit is securely bound with Acme Steel Strapping, all ready to be moved by fork lift truck.

Shipping hundreds of awkward-to-pack, hard-to-handle automobile bumpers to auto assembly plants presents no problem to United States Spring & Bumper Co., Los Angeles. They quickly fasten each pallet-load of bumpers together securely with Acme Steel Strapping, making large easily-handled units.

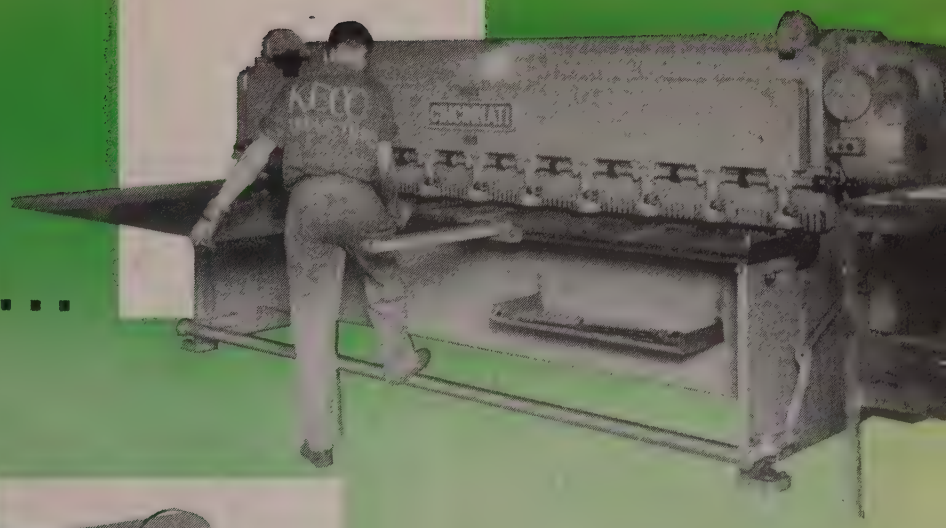
This makes individual wrapping and loading unnecessary. And it takes only a matter of minutes to strap these bumpers onto pallets. Acme Steel Strapping saves time, money and weight, protects each pallet-load from damage and insures S. A. (Safe Arrival).

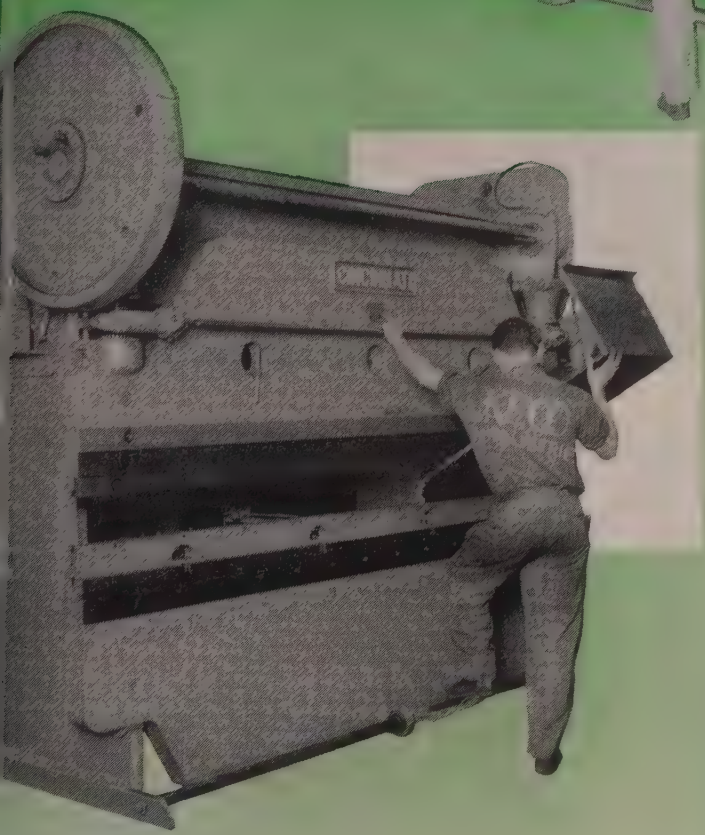
Whatever packaging problems you may have in your plant, chances are that Acme Steel Strapping or Acme Steel Stitching can solve them. Ask your Acme Steel representative. Or write to Acme Steel Products Division, Dept. S93, Acme Steel Company, 2840 Archer Ave., Chicago 8, Illinois.

STRAP IT . . . STITCH IT . . . SHIP IT . . . SAFELY!

ACME STEEL

3 times as fast...





graphs courtesy of the Keco Industries,
nnati 25, Ohio

with this CINCINNATI team

Cooling towers for portable air conditioning units

The floor-to-floor time consumed in shearing and forming panels for air-conditioning units, was cut from 12 minutes to 4 minutes at Keco Industries, using a Cincinnati Brake and a Cincinnati Shear.

Accuracy and rapid handling effected these savings.

In your shop, there may be opportunity for real costs reductions. Investigate Cincinnati Shears and Cincinnati Press Brakes.

Write for Cincinnati Shear Catalog S-6 and Cincinnati Brake Catalog B-4.

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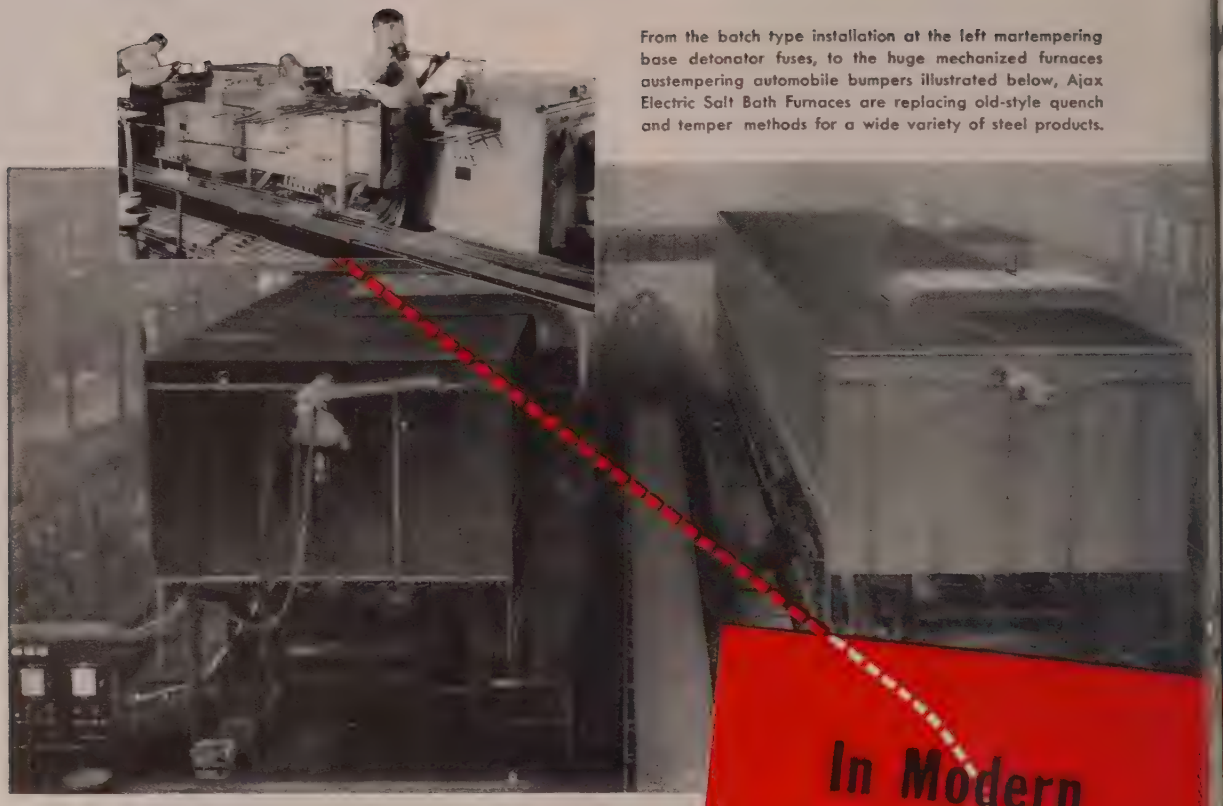
THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A. SHAPERS • SHEARS • BRAKES



From the batch type installation at the left martempering base detonator fuses, to the huge mechanized furnaces austempering automobile bumpers illustrated below, Ajax Electric Salt Bath Furnaces are replacing old-style quench and temper methods for a wide variety of steel products.

In Modern Heat Treating— the Trend is to MARTEMPERING and AUSTEMPERING

From ring gears to plow points . . .

From bearing races to cast iron cylinder sleeves . . .

From uniformly shaped metal parts to odd and irregular sizes . . .

Scores of installations have proved the tremendous possibilities for economy, greater speed and efficiency in martempering and austempering, because all water and oil quenches are eliminated.

Distortion is so negligible that parts can be machine finished *before* hardening. Final grinding is eliminated or materially reduced. Scale, decarb and quench cracks are eliminated. Toughness and ductility are increased. The work is done materially faster—in less floor space—with lower labor costs. Let the Ajax Metallurgical Service Laboratory prove these claims on a specimen batch of your actual parts, under actual working conditions.

Write for Ajax Bulletin 120

AJAX ELECTRIC COMPANY, INC.

952 Frankfort Ave. Philadelphia 23, Penna.

World's largest manufacturer of electric heat treating furnaces exclusively

AJAX ELECTRIC SALT BATH FURNACES

See us at the Metal Show in Cleveland—Booth 221.

MASSIVE NEW SIMMONS PIT LATHE

performs above specifications

FOR LUKENS STEEL

MACHINES 14-FOOT-DIAMETER ALLOY STEEL DRYER ROLLS

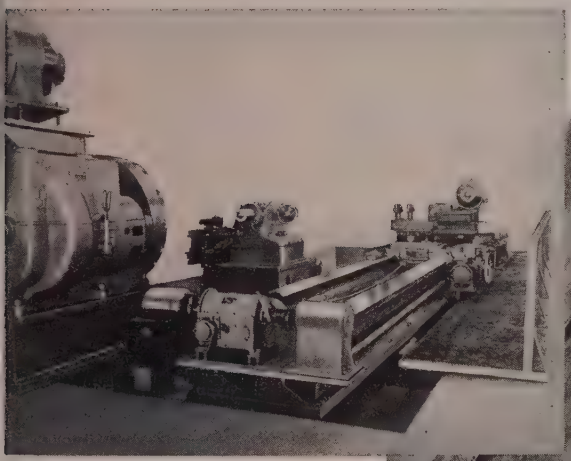
Simmons engineers designed and built this unusual lathe to meet Lukens Steel Company's problems in machining the outer surfaces of their Steam Jacketed Dryer Rolls.

These unwieldy rolls, which run as large as 14 feet in diameter with 30-foot centers, had to be precision machined to a smooth, highly-polished finish. Any irregularities would result in poor heat transfer.

RESULT: *Lukens engineers report that this pit lathe is performing above the specifications that they originally set.*

Turning and grinding carriages on the lathe are motor-driven over the length of a 42-foot bed and can work rolls from three to fourteen feet in diameter. The tool carriage runs parallel to the pit and the surface of the slowly-turning rolls. All movement is synchronized for maximum accuracy.

If you have a production problem which might be solved by a large, special machine tool, Simmons engineers may be able to help you as they have helped so many others. Write or phone us your problem today. And ask for our quarterly publication, *The Simmons Way*. It describes many other case histories about successful machine tool design, manufacture, and rebuilding.



End-on view *of Luken's Pit Lathe shows pit needed for free clearance of large diameter rolls. Carriage travels length of pit.* **At Right:** *42-foot, 17-ton bed of the lathe; ways were finish-ground to 0.002 in.*

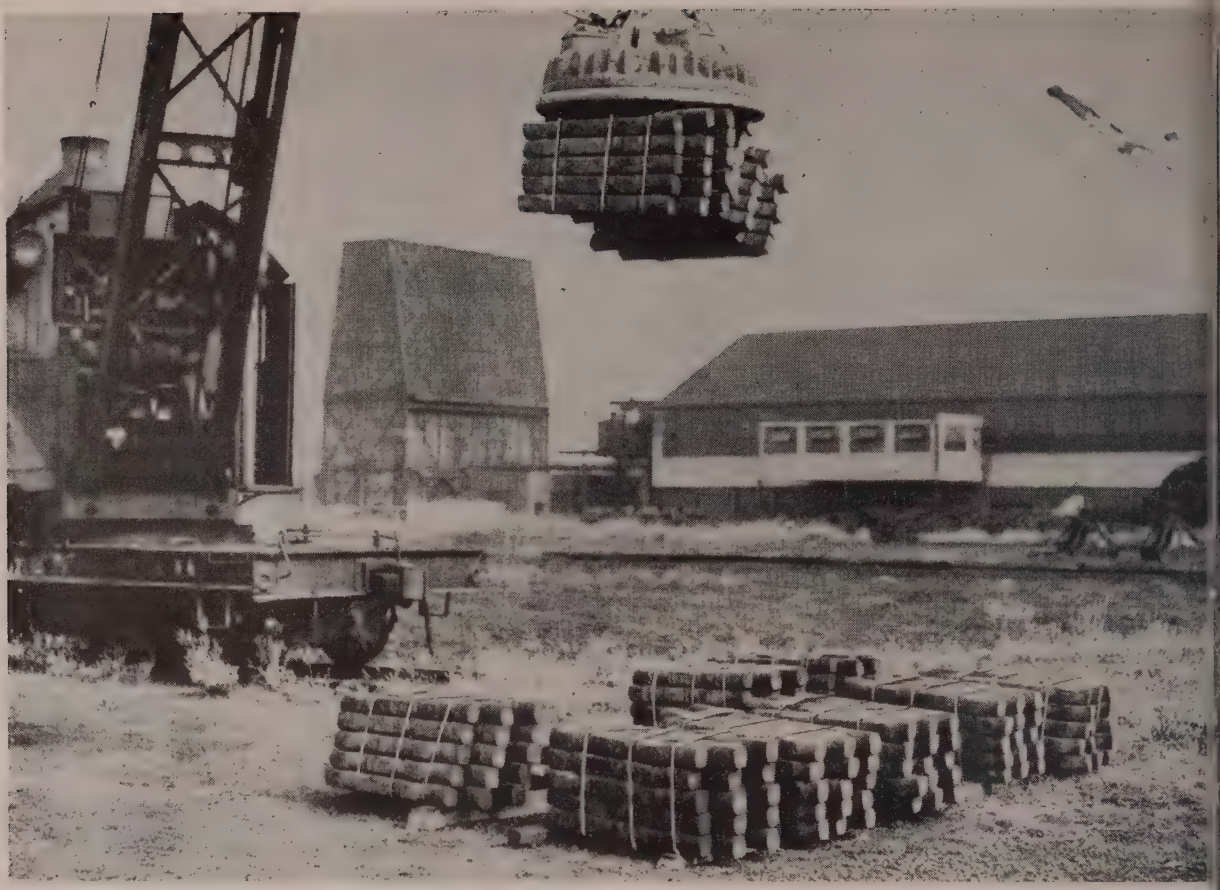
SIMMONS—FOR THE LARGE SPECIAL MACHINE TOOLS THAT OTHERS SELDOM BUILD

SIMMONS MACHINE TOOL CORPORATION, 1755 North Broadway, Albany 1, New York

New York Office: 50 East 42nd Street, New York 17, New York

In Philadelphia, phone: Victor 8-3133

In Pittsburgh, phone: Penhurst 1-3700



Twenty-five steel forgings are held securely with three Gerrard Round Steel Straps.

Tie it *safe* with U·S·S Gerrard Steel Strapping

● There is a size and style of U·S·S Gerrard Steel Strapping to fit every tying requirement from carload to parcel post. U·S·S Gerrard Round Strapping, from 8 to 18½ gauge, conforms readily to odd-shaped and circular packages as well as to rectangular cartons and crates, and to conventional reinforcement applications.

U·S·S Gerrard Flat Strapping is available in heavy-duty sizes for carload reinforcement and palletizing. U·S·S Gerrard Tools for stretching and sealing Flat Steel Strapping are among the most modern and efficient now made.

Gerrard engineers are completely familiar with good tying and packaging procedures from carload to parcel post. Let a Gerrard engineer advise you about the tying method best suited to solve your tying problems safely and economically. His advice is available free of charge. Phone, write or wire for further information.

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U·S·S GERRARD

Round Steel **STRAPPING** *Flat Steel*

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UNITED STATES STEEL

The fable of The Three Brothers

HOLDS A LESSON FOR CUTTING FLUID USERS

The Fable

THREE brothers inherited equal shares of their father's farm. One brother feverishly worked his land, with seldom a rest, until prematurely worn out, he died at an early age. The second brother loafed and played until his land went to ruin and he died for want of food. The third brother, wiser than the other two, *balanced* his work and play, so that he prospered mightily and lived to a ripe old age.

The Lesson

BALANCING cutting fluids produces best results, too. The *proper balance of chemical activity* will provide the longest possible tool life consistent with surface finish desired.

Figure 1 shows abnormal front clearance wear of a single point tool due to *excessive* chemical activity of the cutting fluid used. The tool failed prematurely, just like the first brother in the fable.

Figure 2 shows abnormal cratering of a tool due to *insufficient* chemical activity of the cutting fluid used. Such cratering is usually associated with poor surface finish. This tool failed prematurely like the indolent brother in the fable.

Both of the above examples of tool failure were developed under identical conditions, except for the degree of chemical activity of the cutting fluids used.

The *proper balance of chemical activity* gives the most profitable results. For the right cutting fluids for your work, ask to have your Stuart Oil Representative call. Use the handy coupon below.

FIG. 1—Abnormal front clearance wear caused by excessive chemical activity of cutting fluid.

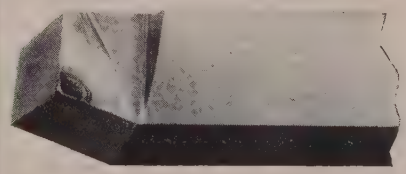


FIG. 2—Cratering of cutting tool, usually associated with poor finish, resulting from insufficient chemical activity of cutting fluid used.

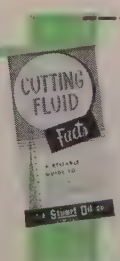
More Than a "Coolant" is Needed

D. A. Stuart Oil Co.
EST. 1865 LIMITED

TIME-TESTED CUTTING FLUIDS AND LUBRICANTS

2735-37 S. Troy St., Chicago 23, Ill.

In Canada: R. W. Horsey Canada, Ltd.
Subs. D. A. Stuart Oil Co., Ltd.
3575 Danforth Ave., Toronto



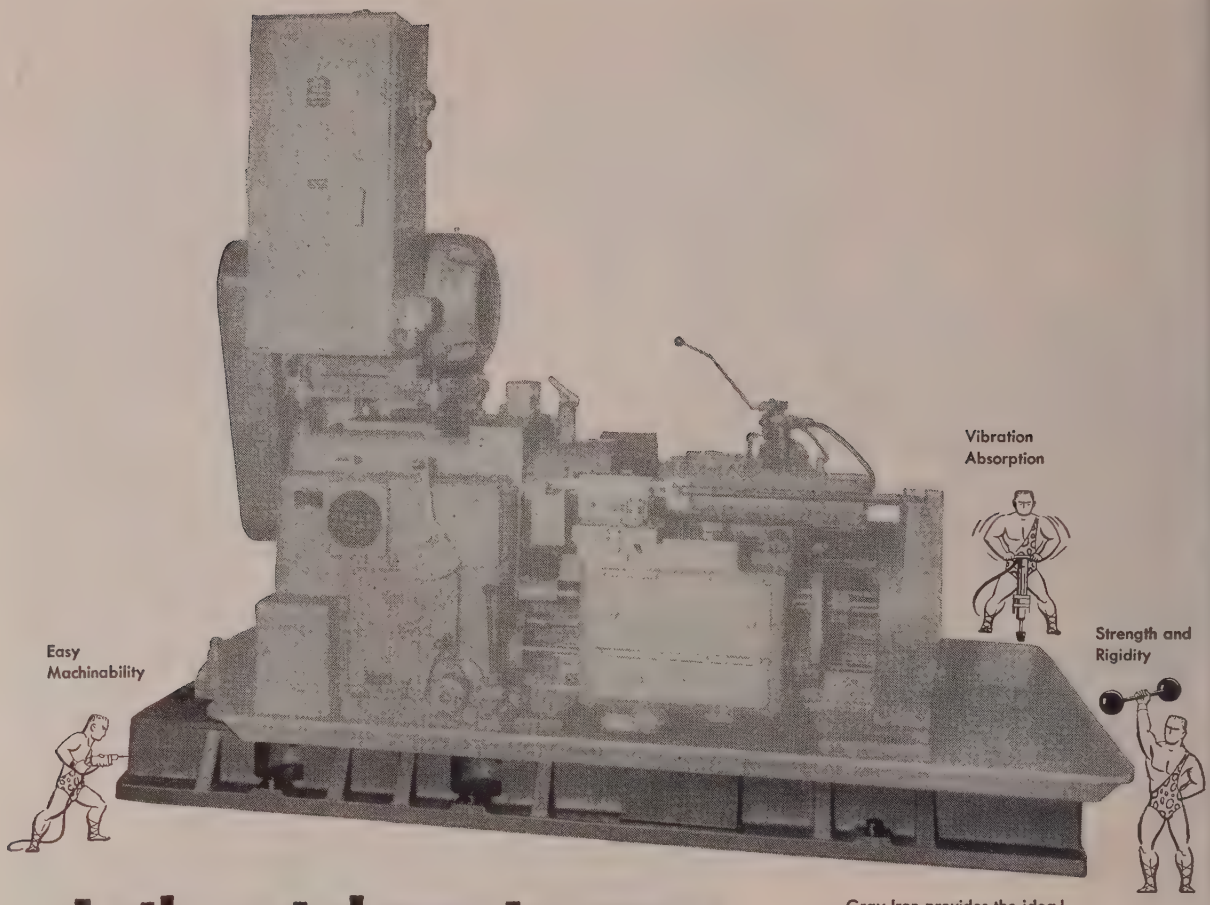
CLIP TO YOUR COMPANY LETTERHEAD AND MAIL

D. A. STUART OIL CO., LTD., 2735-37 S. TROY ST.
CHICAGO 23, ILL.

Check One ☐ Have Stuart Representative Call
☐ Send booklet "Cutting Fluid Facts"

Your name .....

Title .....



Gray Iron provides the ideal combination of characteristics for the base of this automatic lathe.

Let's get down to cases ABOUT BASES!

GRAY IRON Characteristics Include:

- Castability
- Low Notch Sensitivity
- Heat Resistance
- Durability
- Machinability
- Rigidity
- Wear Resistance
- Corrosion Resistance
- Vibration Absorption
- Wide Strength Range

The manufacturer of this automatic lathe had previously used a fabricated steel base. To cut down delivery time and reduce costs, a switch was made to a cast Gray Iron base.

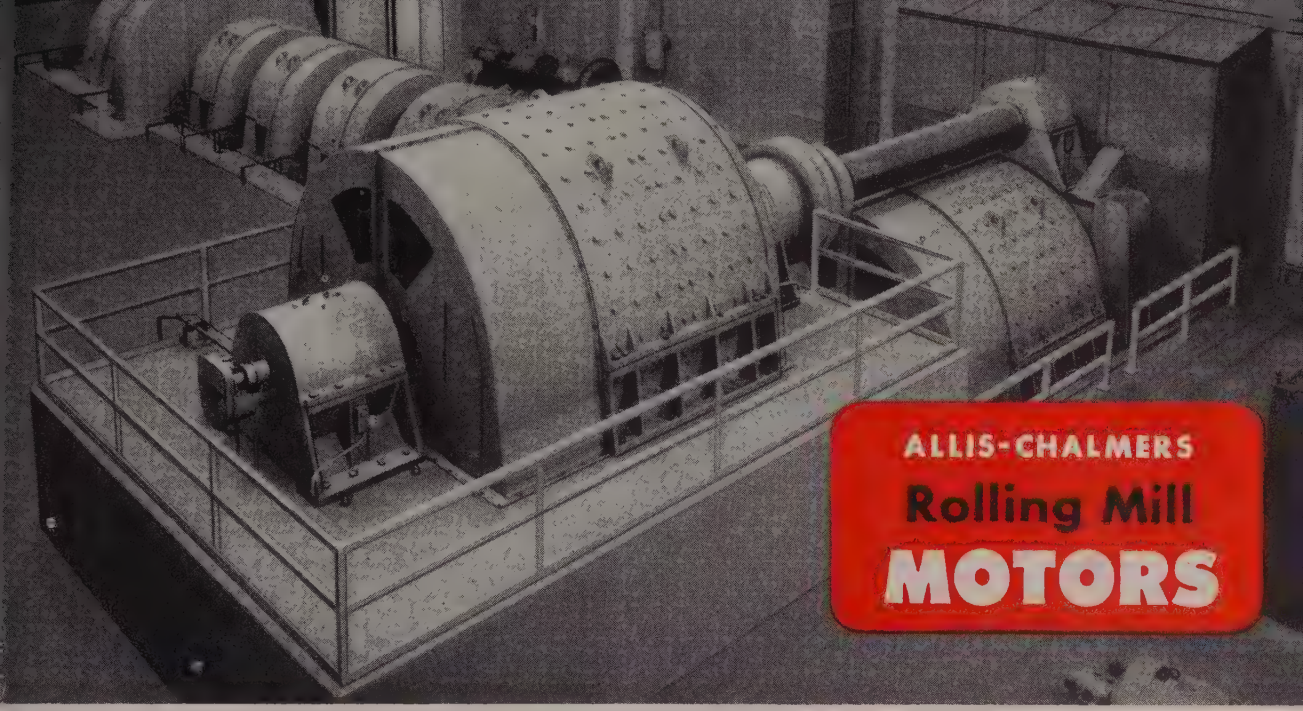
In the manufacturer's own words . . . "in addition to appreciable cost savings, delivery time to our machine shop is about one-eighth that of fabricated steel. Because of the rigidity inherent in the casting, we have a base which is easy to machine, absorbs vibration, and does the kind of a job our customers expect."

When you "get down to cases" about machine tool bases—or any other application requiring the unique combination of advantages listed at the left—be sure to investigate Gray Iron! Write for technical information on the many advantages of the Gray Iron casting process.

Make it Better with Gray Iron • **Second largest industry in the Metal-working field**

GRAY IRON FOUNDERS' SOCIETY, INC.

NATIONAL CITY-E 6th BLDG. CLEVELAND 14, OHIO



Shakedown Time ZERO!

stallation completed April 1. Production arted April 2—at 200 tons an hour.

That's the story of the missing shakedown run at anite City Steel Company's new 45 by 115-inch, two-gh reversing blooming mill. (Eight days later the d blooming mill was torn out, since it was obvious at temporary standby equipment was not needed.) All electrical equipment for this mill was supplied Allis-Chalmers. Pictured above is the 10,000-hp, /80-rpm twin drive and supporting flywheel and excitation m-g sets. A-C is also furnishing the electrical equipment for a new roughing mill and for revamping a finishing mill.

Completion of their current $50,000,000 expansion program later this year will give Granite City Steel a capacity well over a million ingot tons a year.

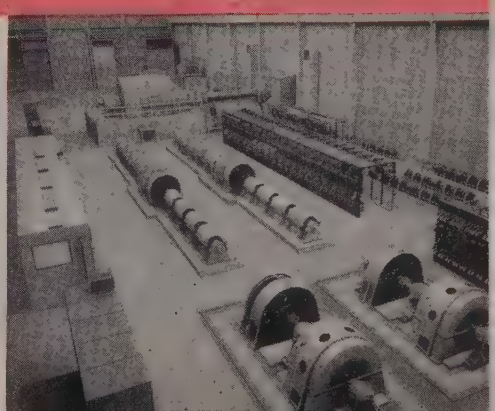
To see how much A-C's wide experience with metal rolling applications can benefit you, call your nearest A-C steel mill representative, or write to Allis-Chalmers, Milwaukee 1, Wisconsin. A-4100

ALLIS-CHALMERS A-C ALLIS-CHALMERS

At left, Granite City Steel's new blooming mill viewed from the main pulpit.

Over-all view of motor room (right) shows ac control and switchgear at left; constant and variable voltage m-g sets in center; dc control panels and *Regulex* exciter sets at right; and the two 5000-hp twin-drive motors and m-g sets in background—all supplied by Allis-Chalmers.

Regulex is an Allis-Chalmers trademark.



Here are two of our basic electric steel furnaces.

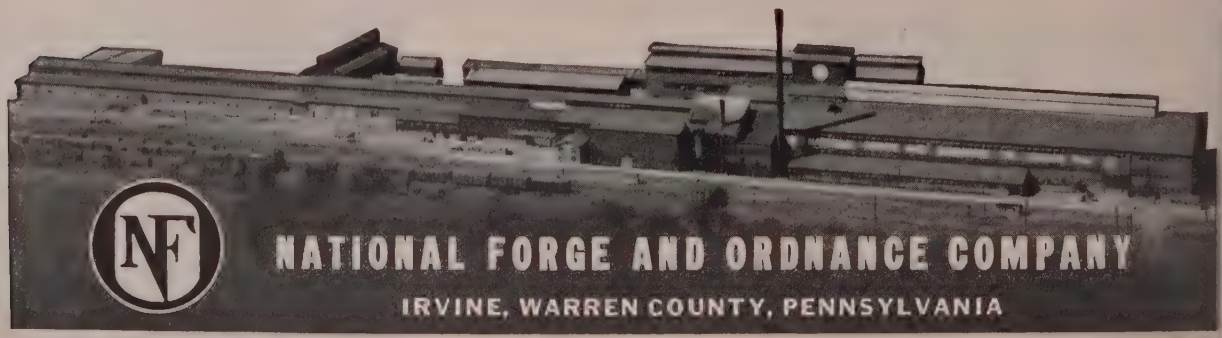
NATIONAL FORGE *ELECTRIC* STEEL

. . . is used exclusively in all of our forgings. This is to your distinct advantage when you have your forgings National-forged.

Electric Steel can be held to close chemical analysis; it is cleaner; it has lower sulphur and phosphorous content and is more uniform from heat to heat.

These qualities of our steel have enabled us to produce forgings for the armed forces that consistently meet their most exacting specifications.

Your forgings will receive the same meticulous care throughout. So why not have them National-forged next time? We offer our facilities and experience for your service; just write NATIONAL FORGE AND ORDNANCE CO., Irvine, Warren County, Penna.



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IRVINE, WARREN COUNTY, PENNSYLVANIA

You can depend on TRICLENE® D (TRICHLORETHYLENE) the rugged degreasing solvent

Made by Du Pont • Pioneer Manufacturer of Degreasing Fluids

Over 20 years' practical and technical experience went into the making of today's "Triclene" D. Each year of research brought new improvements as Du Pont chemists kept pace with the changing demands of metal cleaning. And here's the result—a dependable, top-quality solvent that's in step in every way with today's industrial needs.

Vapor degreasing with rugged "Triclene" D is speeding metal cleaning in thousands of plants. Operators like the way it goes after stubborn buffing compounds, greases and oils; management is sold on its narrow boiling range that simplifies solvent recovery. Both have profited from the friendly, expert assistance of Du Pont and their local distributors. This valuable service can be yours, too—just write: E. I. du Pont de Nemours & Co. (Inc.), Electrochemicals Department, Wilmington 98, Delaware.

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Please send me the literature checked below:

- ☐ "How trichlorethylene is used in metal cleaning".
- ☐ "Triclene" D — an improved vapor degreasing solvent.
- ☐ "Metal degreasing — standard practices."
- ☐ Du Pont publication, "MODERN METAL FINISHING". (Please add my name to the mailing list).

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pick the stainless that fits best

When selecting stainless steel be sure you pick the correct type for your particular application. For some grades resist corrosion better . . . others have superior heat resistant properties. Some are easier to machine . . . still others can be more readily formed or welded.

In every case there is a grade of Crucible REZISTAL Stainless Steel that is best suited to the job. And to help our customers select the type that will provide the best service for the lowest cost, we make available all the design, metallurgical, fabricating and application data we have accumulated in our years of stainless steel experience with many different industries.

Our staff of field representatives brings you the benefit of our vast technical resources. And the quality of REZISTAL Stainless Steel sheets, strip, plates, bars, wire, forgings, castings and tubing produced in our modern integrated mills is unsurpassed in the industry. When you have an application for stainless, call Crucible.

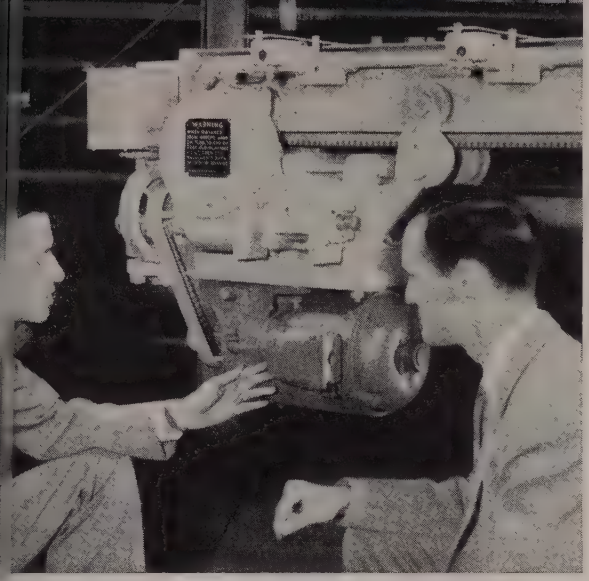
CRUCIBLE first name in special purpose steels

53 years of *Fine* steelmaking

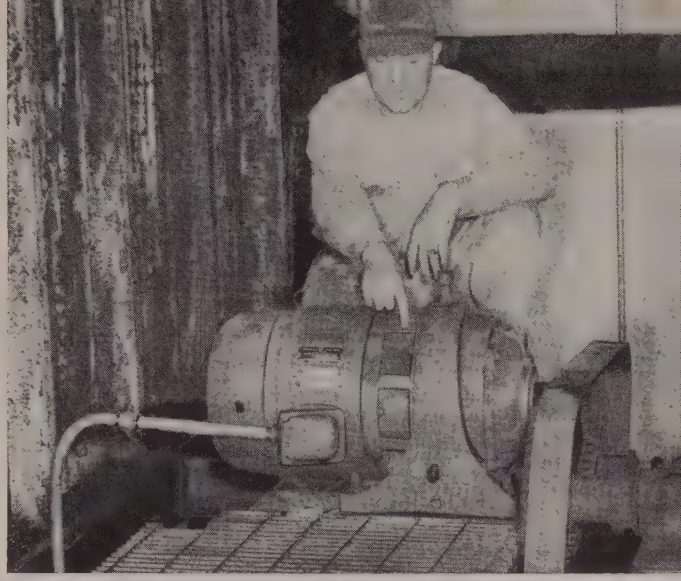
STAINLESS STEEL

CRUCIBLE STEEL COMPANY OF AMERICA, GENERAL SALES OFFICES, OLIVER BUILDING, PITTSBURGH, PA.

STAINLESS • REX HIGH SPEED • TOOL • ALLOY • MACHINERY • SPECIAL PURPOSE STEELS



QUICK INSTALLATION SAVES YOU MANHOURS when G-E gear-motor is used on compact machines like this t blower for power plant equipment. Neat, packaged con-ıction permits quick, easy installation in limited space.

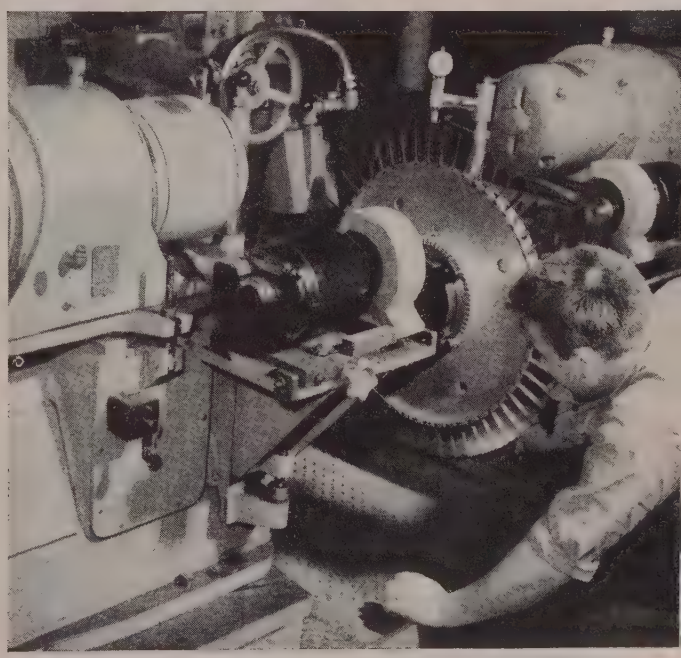


2 SIMPLE MAINTENANCE SAVES YOU MONEY. If electrical maintenance is ever needed on this G-E Tri-Clad gear-motor—driving scraper in a grannery—3-piece design will permit stator removal without disturbing gear train.

ave 4 Ways with G-E TRI/CLAD Gear-motors

REG. U.S. PAT. OFF.

PROMPT DELIVERY SAVES YOU TIME—assures you of getting the gear-motor you need when you need it. new multiple point stock plan permits one-week delivery on ore than 300 models of General Electric gear-motors.



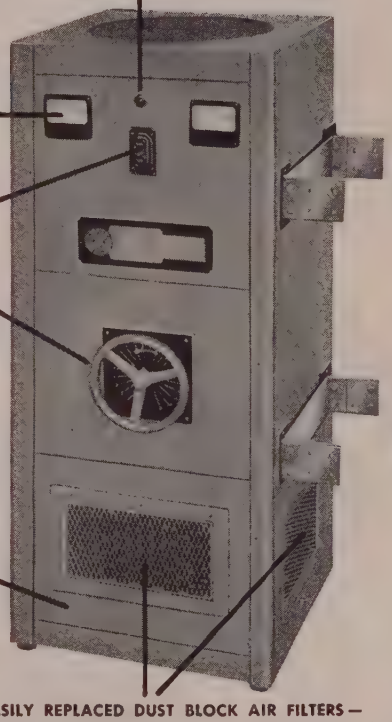
4 THE "RIGHT" GEAR-MOTOR SAVES YOU TROUBLE on precision operations like grinding jet engine bucket blades. General Electric's wide selection assures you of the correct gear-motor for your particular low-speed application.

r more information about G-E Tri-Clad gear-motors contact your nearest G-E representative, agent, or distributor, or write to General Electric Company, Section 755-12, Schenectady 5, N. Y. for your free copy of new Bulletin GEA-1437H.

GENERAL ELECTRIC

NEW H-VW-M HEAVY-DUTY Rectifiers

combine all these features most desired for metal finishing operations



EYE-LEVEL PILOT LIGHT — quick, positive switch indication.

LARGE, SQUARE-TYPE METERS — easy to read, accurate to 2%.

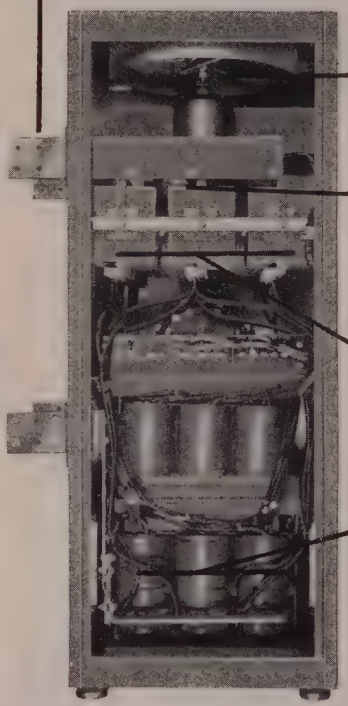
CONVENIENT START-STOP BUTTON — simplified switching for operating *entire* unit.

SINGLE-WHEEL TYPE CONTROL—21 points of fool-proof on-load control, available 10 KW to 20 KW.

AUTOMATIC RESETTING STARTER — DUAL INPUT — full overload protection *plus* low-voltage release. Dual Input: 220/440 v, 3 phase, 60 cycle.

STURDY STEEL CABINET —with angle-iron frames, grey hammertone finish, may be mounted on rubber shocks (optional).

HEAVY-DUTY TERMINALS — deliver 6-phase center-tap output with theoretical ripple of *only* 4.2%.



FAN-DRIVEN UP-DRAFT — oversize fan with sealed motor and lubrication constantly cools transformers and stacks.

PRECISION-CALIBRATED THERMOSTAT — positive guard against excessive stack temperature. Instant cut-off.

CUSTOM-BUILT SELENIUM STACKS — assembled and electrically matched by H-VW-M. Plate areas well above N.E.M.A. specs. Heavy anti-corrosion, anti-fungus coating.

HEAVY-DUTY TRANSFORMERS — Class B insulation type, rated for *continuous* operation at temperature rise up to 25° over ambient, calculated for convection cooling.

EASILY REPLACED DUST BLOCK AIR FILTERS — remove all solids and most fumes. Easy to reach from front of cabinet.

Dual output is available for slight additional cost. Models available in either self-contained or remote-controlled units.

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Imagine... a theoretical ripple of *only 4.2%*. There's real assurance of more uniform deposits! And single-wheel control... only one control for 21 points of on-load switching! And those *oversize* transformers for plenty of reserve capacity—as well as the *increased plate area*... all these, plus the individual features pointed out above, add up to the most complete line of rectifiers ever designed for metal finishing. *Yet they cost less per unit than any other rectifiers made!*

For complete information on H-VW-M Rectifiers ask for Bulletin ER-105.

Your H-VW-M combination—of the most modern testing and development laboratory—of over 80 years experience in every phase of plating and polishing—of a complete equipment, process and supply line for every need.

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BULLARD

MANUFACTURERS OF MACHINE TOOLS

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United Aircraft Corp. Photo

The Invisible Background of Industrial Progress

Faster than sound — United Aircraft's Chance Vought F7U-3 Twin-Jet "Cutlass" fighter plane is designed to out-fly and out-fight any other carrier-based fighter in the world. Its reputed performance is a credit to the ingenuity of its designers and manufacturers of its jet propulsion equipment.

★ The Bullard Company, builders of *Modern Machine Tools,* are proud to have contributed to "The Invisible Background of Industrial Progress" resulting in the success of this fighter — a part of America's first line of defense.

Whether you have small job lots or mass production, we can show you how Bullard Machine Tools can add to your production speed and economy.

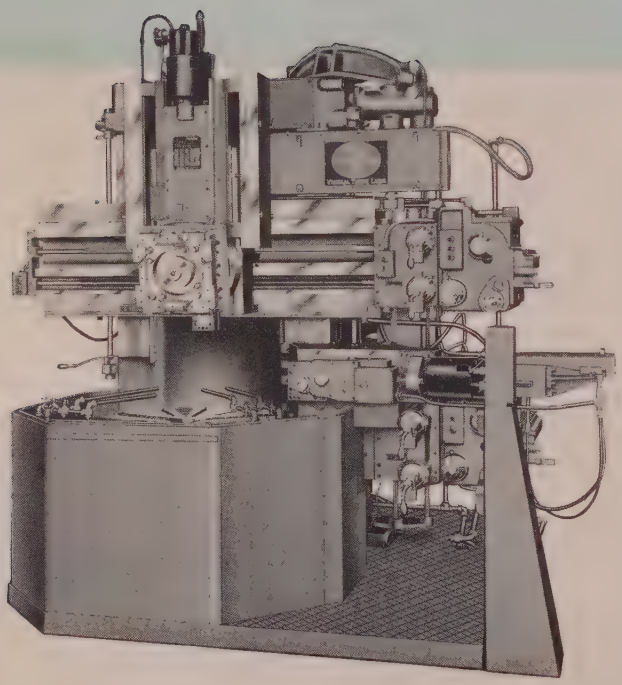
★ *For greater manufacturing economy REFER to next page.*

THE BULLARD COMPANY

BRIDGEPORT 2, CONNECTICUT

BULLARD MACHINE TOOLS FOR GREATER MANUFACTURING ECONOMY

The production of jet engine compressor cases on the Bullard Man-Au-Trol Vertical Turret Lathe is one of the many applications possible for this versatile machine tool.



The machine is ruggedly constructed with "built-in" rigidity to insure accurate machining time after time. It may be operated manually by the operator for small runs or automatically by the Man-Au-Trol for mass production. Whatever your need this machine is flexible in its characteristics to fulfill your exacting requirements.

Let Bullard engineers submit a survey on your specific requirements.

BULLARD

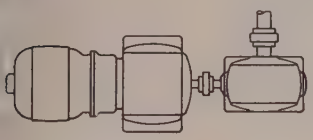
Time saved is money earned. Write now for information on Bullard Man-Au-Trol Vertical Turret Lathe.

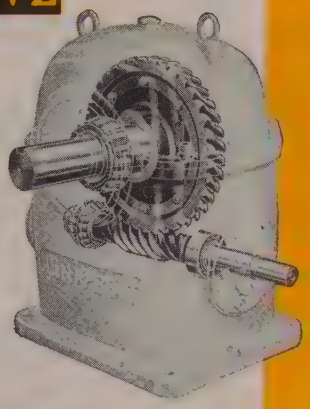
THE BULLARD COMPANY BRIDGEPORT 2, CONNECTICUT

How to change even complex speed reduction problems into *simple* ones

WORM GEAR DRIVE

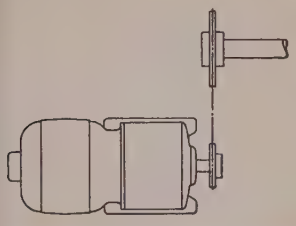
WORM GEAR and P.I.V. variable speed drives are shown direct-coupled. Link-Belt worm gear drives are available in 3.1:1 to 8000:1 reduction ratios—1400 to 123,000 in. lbs. torque—0.22 to 564 output shaft rpm. Ask for Book 2324A.

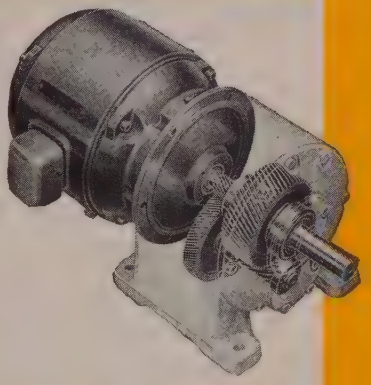




GEARMOTOR & HELICAL GEAR DRIVE

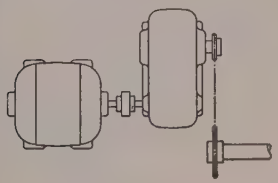
GEARMOTOR is shown with roller chain drive. Link-Belt Helical Gear Drives, Gearmotors and Motogears are available in 6.2:1 to 292:1 reduction ratios—1 to 30 hp—6 to 280 output shaft rpm. Ask for Books 2247 and 2451.

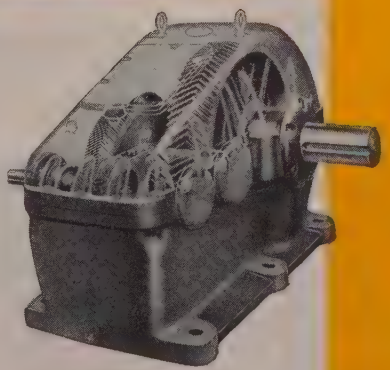




HERRINGBONE GEAR DRIVE

HERRINGBONE GEAR DRIVE is shown connected by flexible coupling to motor and with roller chain take-off. Link-Belt Herringbone Gear Drives are available in 2.84:1 to 326:1 ratios—0.4 to 2480 hp—2.2 to 623 output shaft rpm. Ask for Book 2519.





Get the proper drive combination that best meets your requirements from the broad LINK-BELT line

In addition to matching a wide range of requirements for ratio, hp, loading conditions and similar factors—Link-Belt enclosed gear drives offer you other benefits. When your Link-Belt representative selects a helical, herringbone or worm gear drive, you have no worries about coordinating it with your other components.

For Link-Belt builds a complete power transmission line. There's no need to exchange drawings with a third person to calculate chain, sprocket, coupling, bearing or even shafting requirements. You can get all these from one source . . . each pre-engineered for perfect fit.

Next time you're faced with a speed reduction problem, take it to power transmission headquarters. There's a Link-Belt sales office or distributor near you. Call today for complete engineering information.

LINK-BELT

ENCLOSED GEAR DRIVES

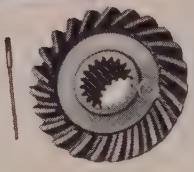
LINK-BELT COMPANY: Plants: Chicago, Indianapolis, Philadelphia, Colmar, Pa., Atlanta, Houston, Minneapolis, San Francisco, Los Angeles, Seattle, Toronto, Springs (South Africa), Sydney (Australia). Sales Offices, Factory Branch Stores and Distributors in Principal Cities.

13,120

METAL DISINTEGRATION

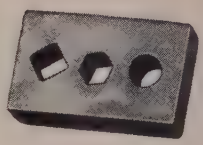
and what it can do for you . . .

Remove Broken Taps fast without distortion

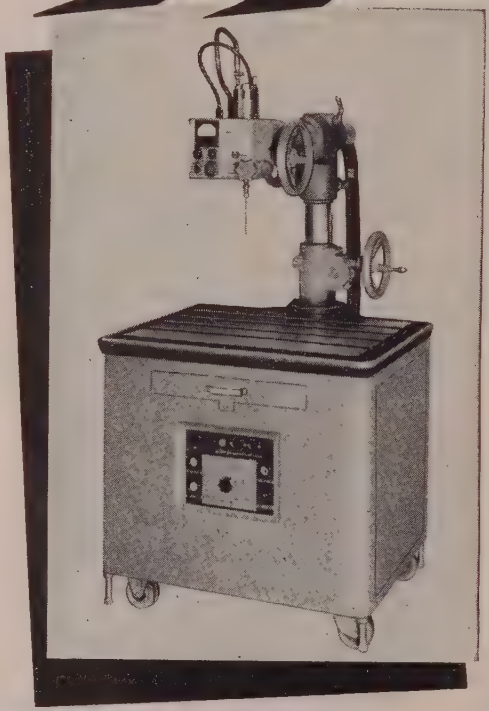


Cut oil holes in hardened gears without annealing

Cut dovetails in hardened dies



Cut any shape hole in cemented carbides



Literally hundreds of thousands of dollars are saved annually by corporations that are using Metalmasters in just tool and die repair alone.

There's a technical engineer in your area to give you an on-the-spot demonstration in your own plant at your convenience. (NOTE: It is not uncommon to pay for a Metalmaster with just one short demonstration thru savings on workpieces.)

SEE US AT THE CLEVELAND SHOW: BOOTH NO. 2340

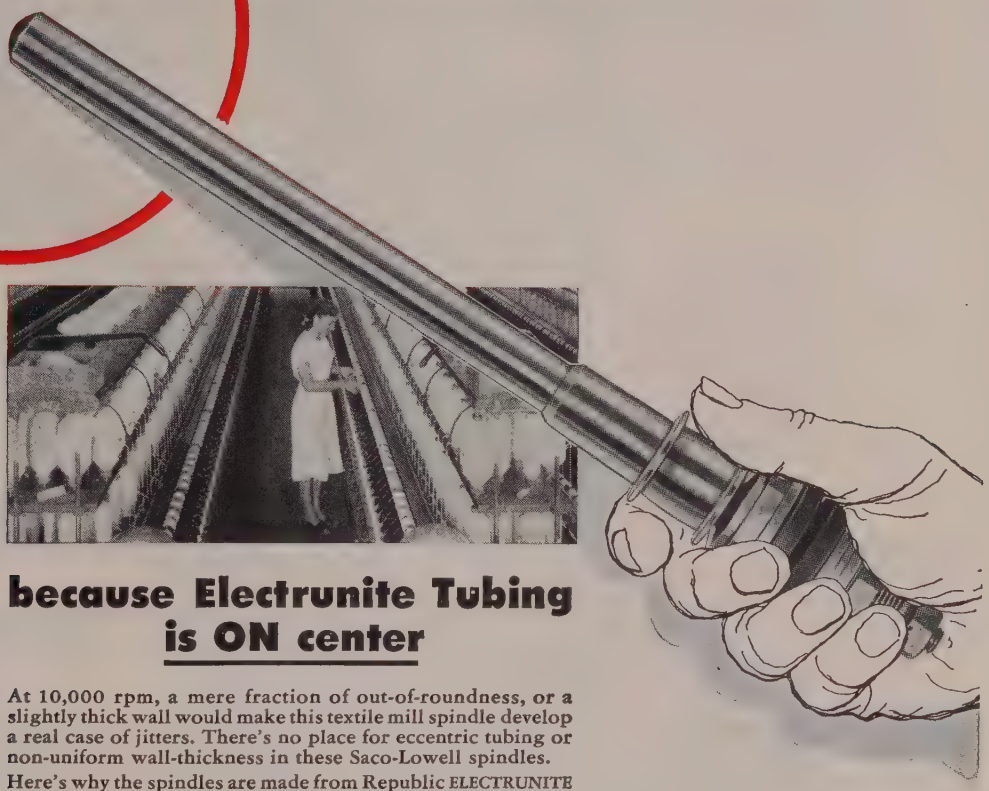
For information as to the Metalmasters' uses and benefits merely write today on your company letterhead to:

Metalmaster

DIVISION OF CLINTON MACHINE COMPANY

CLINTON, MICHIGAN

10,000 smooth RPM on 25% less power . . .



because Electrunite Tubing is ON center

At 10,000 rpm, a mere fraction of out-of-roundness, or a slightly thick wall would make this textile mill spindle develop a real case of jitters. There's no place for eccentric tubing or non-uniform wall-thickness in these Saco-Lowell spindles.

Here's why the spindles are made from Republic ELECTRUNITE Steel Tubing . . .

Uniform wall thickness and concentricity are assured by the way ELECTRUNITE Steel Tubing is made. The carefully rolled flat steel is inspected on both sides. Then it's formed on precision rolls into a cylindrical shape that's electric resistance welded to make a uniformly strong tube.

The tubes are uniform in every dimension, every contour. They can be fabricated uniformly to produce these spindles that must turn at 10,000 rpm.

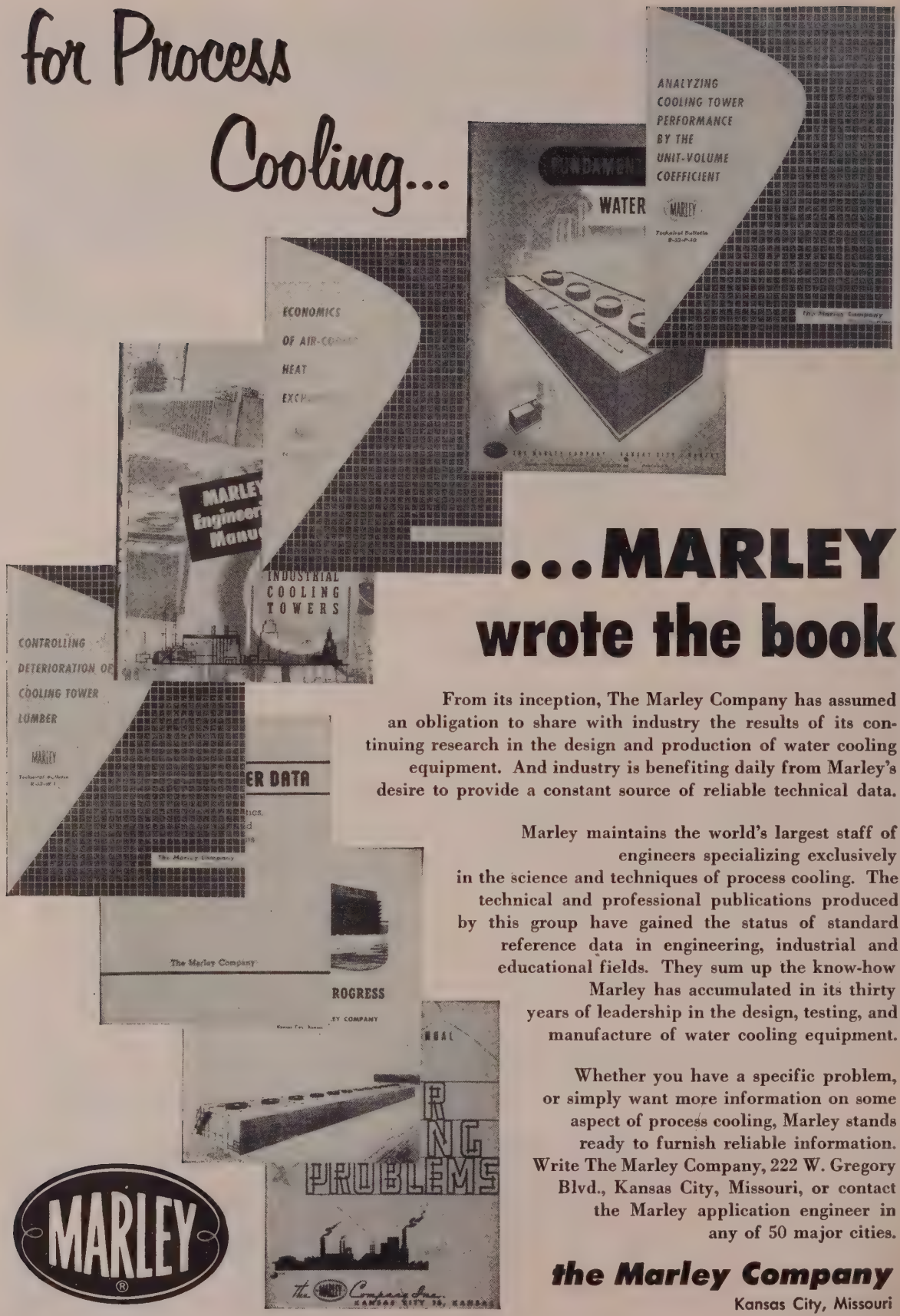
One thing more . . . uniformity and concentricity contributed greatly to the development of ball-bearing spindles that cut textile mill power bills as much as 25%.

Probably you have products that would be better or cheaper or longer lasting if you made them from Republic ELECTRUNITE Steel Tubing. We'd like to help you investigate the possibilities.

STEEL AND TUBES DIVISION
REPUBLIC STEEL CORPORATION
253 EAST 131st STREET • CLEVELAND 8, OHIO
Export Department: Chrysler Building, New York 17, N.Y.

Republic
REPUBLIC STEEL
ELECTRUNITE TUBING

for Process Cooling...



...MARLEY wrote the book

From its inception, The Marley Company has assumed an obligation to share with industry the results of its continuing research in the design and production of water cooling equipment. And industry is benefiting daily from Marley's desire to provide a constant source of reliable technical data.

Marley maintains the world's largest staff of engineers specializing exclusively in the science and techniques of process cooling. The technical and professional publications produced by this group have gained the status of standard reference data in engineering, industrial and educational fields. They sum up the know-how Marley has accumulated in its thirty years of leadership in the design, testing, and manufacture of water cooling equipment.

Whether you have a specific problem, or simply want more information on some aspect of process cooling, Marley stands ready to furnish reliable information. Write The Marley Company, 222 W. Gregory Blvd., Kansas City, Missouri, or contact the Marley application engineer in any of 50 major cities.

the Marley Company
Kansas City, Missouri

NOW – NEMA Type XII

THE ONLY SAFETY SWITCH IN SPECIAL INDUSTRY ENCLOSURE!

CAPTIVE SCREWS assure tight cover fit

EXTERNAL MOUNTING FEET eliminate need for conventional leaky mounting holes within the enclosure

NEOPRENE GASKET provides positive cover seal

WELDED TIGHT ENCLOSURE without knockouts excludes dirt, dust, oil, and splashing coolant

This new heavy duty switch, built to NEMA XII specifications, is "tailor-made" for applications requiring the exclusion of dirt, dust, oil and coolant.

The rugged, visible-blade switch mechanism within the special industry enclosure has all the performance features that have made Square D an overwhelming "first choice" for fifty years.

ASK YOUR ELECTRICAL DISTRIBUTOR FOR SQUARE D PRODUCTS

SQUARE D COMPANY

1903 • 50 YEARS OF DESIGN LEADERSHIP • 1953

LIGHT, VERSATILE, RUGGED DELTA TOOLS lead new trend in Metalworking

There's a basic change going on in the metalworking industry—a wholesome, profitable change, with the pace increasing daily—as alert shop men discover that on many operations light, rugged, versatile Delta power tools can out-perform and out-produce heavier, costlier installations.

These five potent facts go far toward explaining the economic common sense of this change:

DELTA TOOLS ARE ACCURATE—their accuracy is built in, makes close precision tolerances easy to achieve.

DELTA TOOLS ARE ADAPTABLE—unusually mobile and portable, they can be tooled for a given job, kept in the tool crib, then moved into and out of production lines with no lost time for setting up; can be used for continuous high-production runs of single or multiple operations.

DELTA TOOLS ARE DURABLE—rugged to withstand hard usage . . . precision built and beautifully balanced, they perform most efficiently throughout long, useful lives.

DELTA TOOLS ARE ECONOMICAL—first cost is moderate; and is quickly amortized by low power cost, low maintenance expense, increased output and elimination of bottlenecks and slower methods.

Dollar for dollar, Delta tools deliver more. Here are 5 reasons why:

1. Lubricated-for-life ball bearings eliminate lubrication problems.
2. Precision bored bearing seats assure accuracy and smooth operation.
3. Preloaded bearings provide maximum rigidity and accuracy under load.
4. All spindles, arbors and collars are precision ground for accuracy.
5. Dynamic balance of rotating parts insures smooth, true performance.

DRILL PRESSES

With Delta Drill Presses, you can work out any set-up to suit your own need—using one spindle or as many as your job requires. Any set-up you want is not merely possible, but is actually very easy—because Delta drill presses have the flexibility to make them fit readily into any multiple spindle set-up. Low in cost, easy to maintain, readily portable, the Delta Drill Press is a good example of fine engineering, rugged construction and compact design.

A 14" DRILL PRESS

Available with either No. 1 Morse taper spindle or Jacobs chuck that takes straight shank drills from No. 60 to full ½-inch. In high- or slow-speed models. Capacities up to ½-inch in cast iron; ⅜-inch in steel. Quill has 4-inch stroke. Spindles are readily interchangeable—a simple matter to select the right spindle for any job.

B 17" DRILL PRESS

Available with either No. 2 Morse taper spindle or ½-inch Jacobs chuck. In high- or slow-speed models. Capacities up to ¾-inch in cast iron. Quill has 5-inch stroke.

METAL CUTTING

C CUT-OFF MACHINE

Cut steel, aluminum, copper, brass in one fast, easy motion with a Delta Cut-Off Machine. It's easily changed from a non-ferrous to a ferrous cut-off machine by switching from steel blade to abrasive wheel.

D 14" METAL CUTTING BAND SAW

Cuts anything from carbon tool steel to asbestos, in hundreds of applications. Four metal-cutting speeds: 125, 175, 250, 340 f.p.m.—change from metal to wood with just a flip of your finger and simple belt change.

SHAPER

E 7" PRECISION METAL SHAPER

This husky "machine of a thousand uses" is extremely popular in machine shops, tool making and model making shops, schools and experimental departments. "V"-type ways on ram, tool head and front face of main frame insure accuracy and longer life.

FINISHING MACHINES

F DEBURRING Machine

The easy, practical, low-cost way to handle a multitude of metal removal operations. Eliminates bother of "set-up wheels" and dressing of "grinding wheels"—inexpensive, long-wearing abrasive belts are easily replaceable. Much lower in cost than any comparable machine on the market.

G ABRASIVE BELT FINISHING Machine

This 6" belt-type abrasive finishing machine is heavy and husky enough to do dozens of sanding, polishing and finishing operations, yet is portable. Operates vertically or horizontally.

H ABRASIVE DISK FINISHING Machine

This machine is ideal for an accurate, fast finishing job. It can be moved to any place in the shop or on the production line. Abrasive disks can be renewed every few minutes if necessary.

WELDERS

I DELTA Combination 5 KVA SPOT and 120 AMP. ARC WELDER

For any shop doing a lot of light duty production spot welding and intermittent arc welding. Unique design, careful engineering and high production methods permit pricing it considerably under two individual welders.

J DELTA 5 KVA Automatic SPOT WELDER

Compared to other spot welders, this compact unit is conspicuous for efficiency and low cost. It is extremely simple and easy to operate, and has an unusually wide range of capacity.

GRINDERS

K Toolmaker GRINDER

As a Chip-Breaker Grinder. With univise and coolant attachment, the Toolmaker surface grinder is a precision machine which grinds the chip breaker groove in carbide tipped tools.

As a Tool and Cutter Grinder. With the Toolmaker tool and cutter grinding attachment, it becomes an economical machine for easy sharpening of tools and cutters.

As a Standard Surface Grinder. The basic Delta Toolmaker surface grinder does every type of surface grinding required in the tool room or production shop. It's a big, rugged machine with the massiveness and solidity needed to produce accurate work.

L CARBIDE TOOL GRINDER

Here's the accurate, low cost way to grind your tungsten-carbide tools—the Delta Carbide Tool Grinder. Made in two styles—bench and pedestal—a wide range of motors are available.

M STANDARD TOOL GRINDER

Here's the grinder "that can't forget its goggles." In addition to its unsurpassed safety features, it's a money-saver—sturdy, accurate, highly adaptable, easy to use and low in cost.

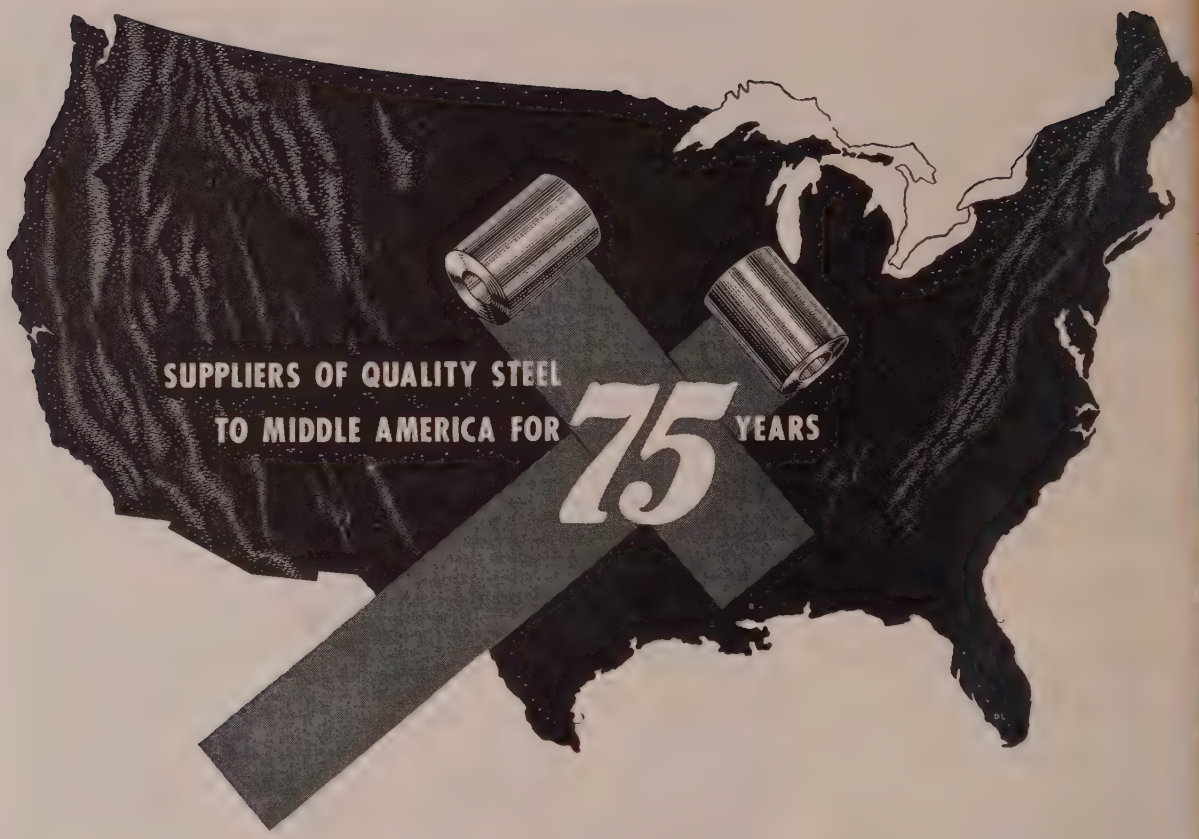
There's a Delta Power Tool for Your Job - WOOD OR METAL WORKING 53 MACHINES • 246 MODELS • MORE THAN 1300 ACCESSORIES

DELTA MILWAUKEE

DELTA·POWER TOOL DIVISION

Rockwell Manufacturing Company

6381 North Lexington Avenue • Pittsburgh 8, Pa.



Granite City Steel Marks Its 75th Year with an Expansion and Modernization Program To Help Serve You Better

Recognition comes hard here in the Middle West... but a reputation, once built, stands fast. We are glad that in this, our 75th year, grandsons of our first puddlers are producing steels and steel products for grandsons of our original customers. To us, it shows enduring faith in business reputation built the lasting way . . . through a record of technical accomplishment and service rendered.

A comprehensive modernization and expansion program going on right now at Granite City Steel means better steel, and more of it, leaving from St. Louis up and down the Mississippi. And, as always, you can count on the same expert, experienced handling of your steel problems that our long list of customers has learned to expect.

OUR PRODUCTS: Ingots • Hot Rolled Sheets Strongbarn Galvanized Roofing and Siding (Patented) Cold Rolled Sheets • Electrical Sheets • Tin Mill Products • Electrolytic Tin Plate • Porcelain Enameling Sheets • Fabricated Products • Hi-Strength Corruform Pig Iron • Coal Chemicals

SINCE GRANITE CITY STEEL 1878

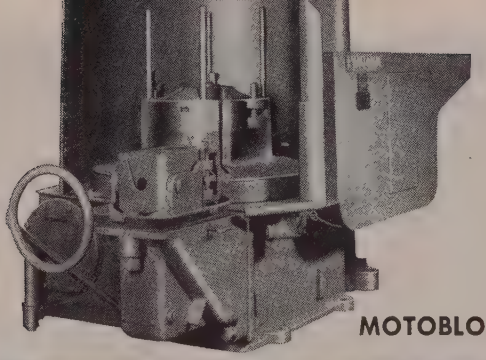
GENERAL OFFICE and PLANT
Granite City, Illinois

DISTRICT SALES OFFICES:
Dallas, Texas • Kansas City, Missouri • Memphis, Tennessee • Minneapolis, Minnesota • St. Louis, Mo.

GRANITE CITY STEEL COMPANY, Granite City, Illinois

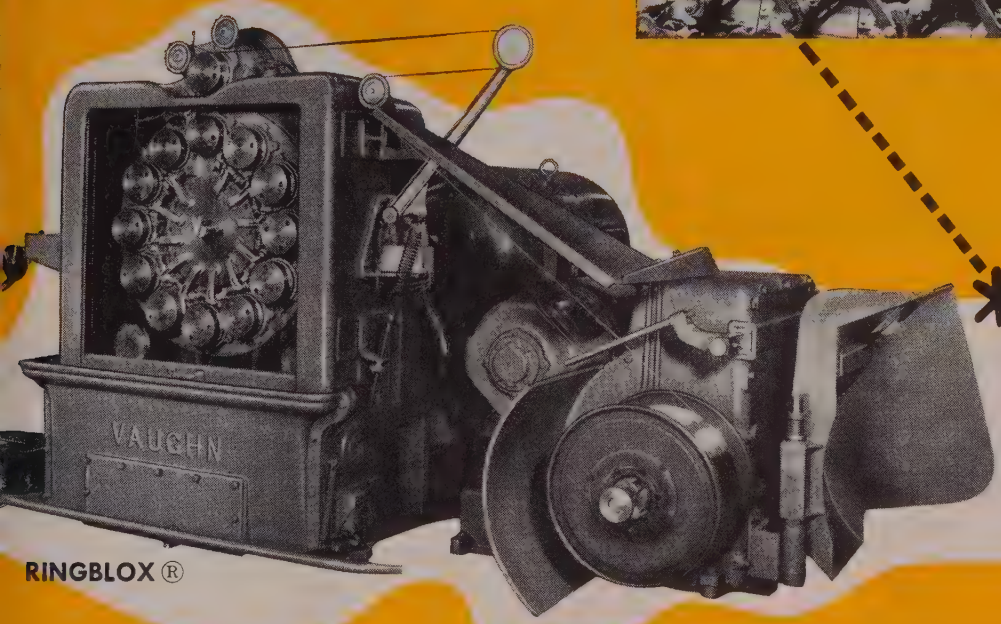
COLD DRAWING EQUIPMENT *exclusively*

® VAUGHN MACHINERY



MOTOBLOC ®

MOTOBLOX ®



RINGBLOX ®

We're specialists in Cold Drawing Equipment. No other manufacturing interests divide our concentration—one of many good reasons for VAUGHN leadership in the field!

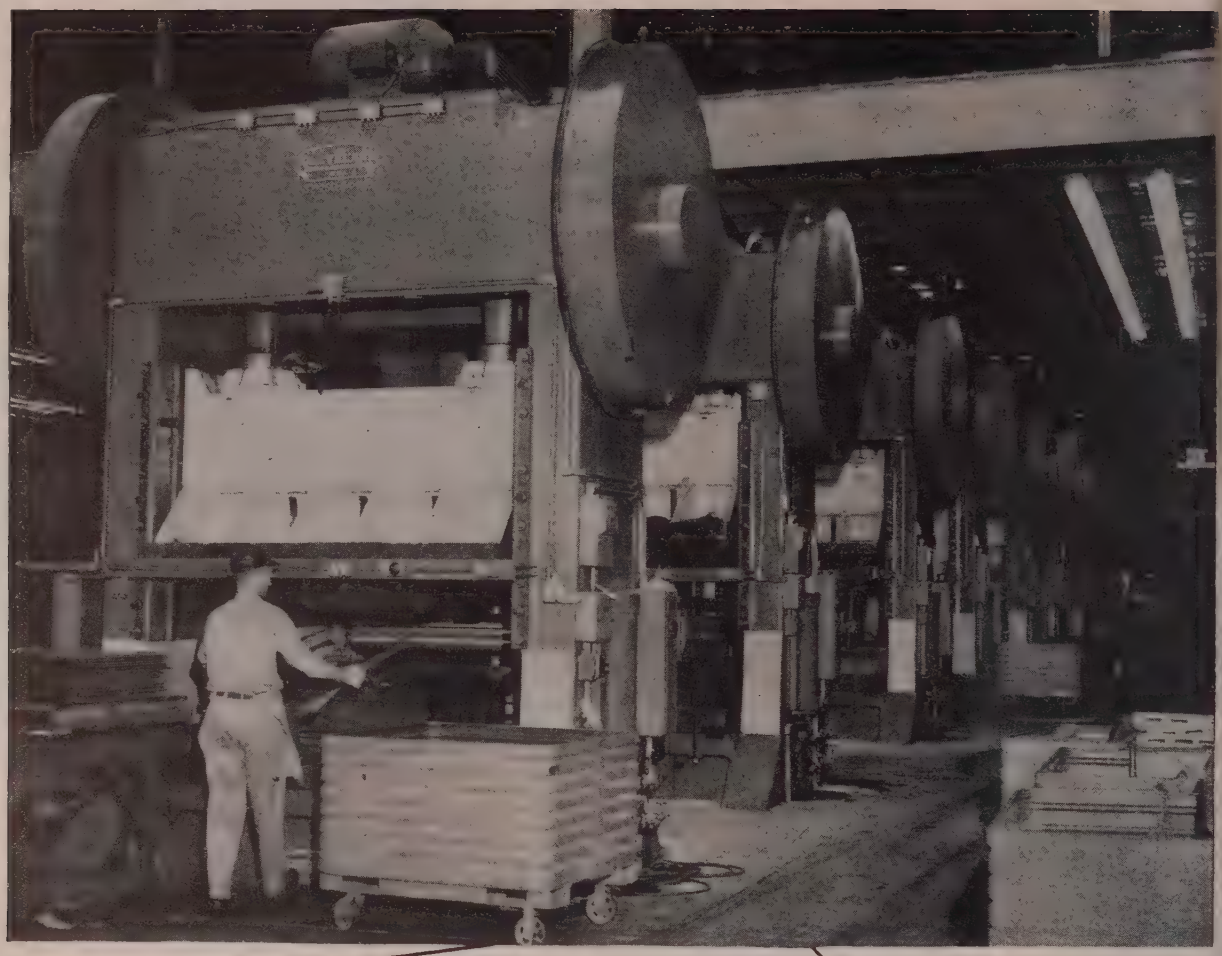
THE VAUGHN MACHINERY CO.

CUYAHOGA FALLS, OHIO, U.S.A.

COMPLETE COLD DRAWING EQUIPMENT . . . Continuous or Single Hole . . . for the Largest Bars and Tubes . . . for the Smallest Wire . . . Ferrous, Non-Ferrous Materials or their Alloys.

"Quick on the Draw" ®

DRAWBENCHES



CLEVELAND PRESSES FORM RANGE TOPS FOR GENERAL ELECTRIC

These 8 new Cleveland Presses, are now in operation at Appliance Park, Louisville, Kentucky, General Electric's new appliance center, producing parts for famous General Electric ranges.

We're proud that Clevelands were chosen for this new press battery. Their selection resulted from General Electric's constant search for increased efficiency through improved equipment and methods. All of these presses are equipped with the Cleveland (patented) Drum Type Clutch.

If you, too, need greater press efficiency, you can't afford to overlook the economies and production advantages offered by Cleveland Presses. They are made in a complete range of types, sizes and capacities, so you can be sure of getting the exact press for your particular requirements. Why not call a Cleveland representative? He'll gladly study your needs and after consulting with our engineers, he'll give you figures that we're sure you'll find interesting.

A-7987

THE CLEVELAND PUNCH & SHEAR WORKS CO. U.S.A.

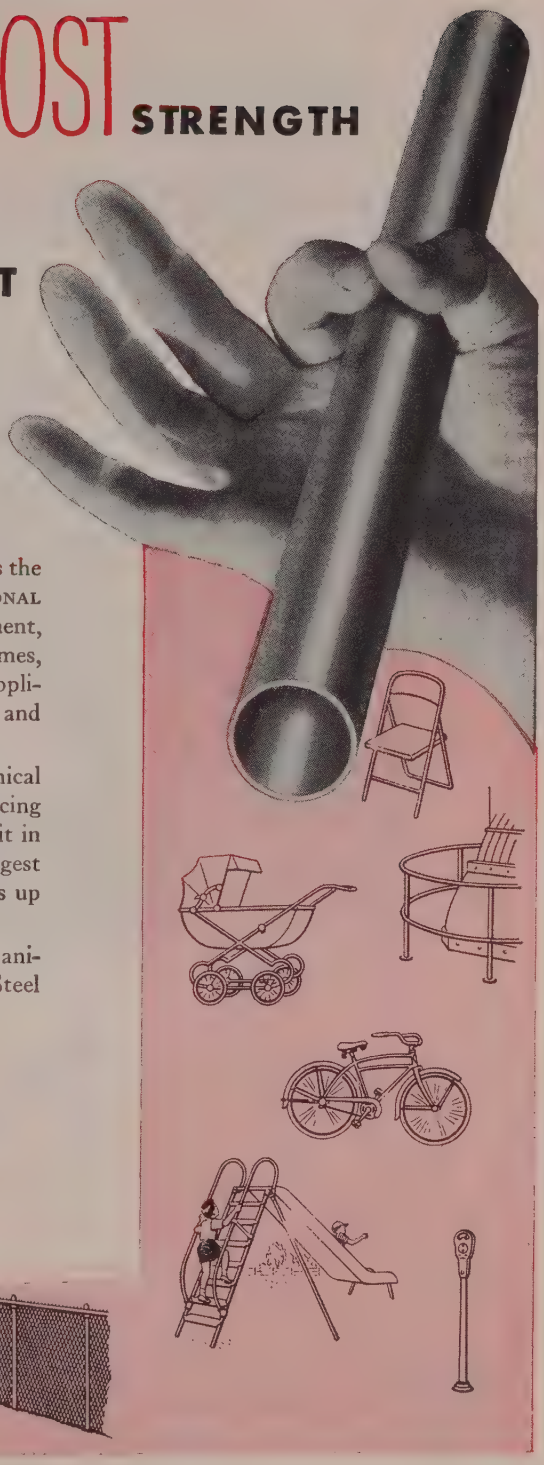
THE CLEVELAND PUNCH & SHEAR WORKS COMPANY

CLEVELAND 14 • OHIO

NEW YORK • CHICAGO • DETROIT • PHILADELPHIA • E. LANSING

WHEN YOU WANT THE MOST STRENGTH WITH THE LEAST WEIGHT

USE A TUBE

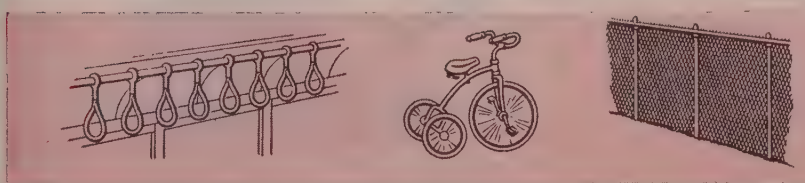


• Why? Because, in proportion to size and weight, a tube is the *strongest structural form you can buy*. That's why NATIONAL Electric Welded Tubing is a natural for playground equipment, bicycles, baby carriages, lighting fixtures, furniture, seat frames, fence posts, guard rails, and hundreds of other mechanical applications, including automobile tail pipes, shot hole casing and flue tubes for water heaters.

If you are looking for a good commercial quality, mechanical steel tubing that will give you true economy without sacrificing quality and reliability in the finished product, you'll find it in NATIONAL Electric Welded Tubing. Made by the world's largest manufacturer of steel tubular goods, it is available in sizes up to and including 4″ O.D.

Send your inquiries for NATIONAL Electric Welded Mechanical Steel Tubing to National Tube Division, United States Steel Corporation, 525 William Penn Place, Pittsburgh 30, Pa.

NATIONAL TUBE DIVISION
UNITED STATES STEEL CORPORATION, PITTSBURGH, PA.
(Tubing Specialties)
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

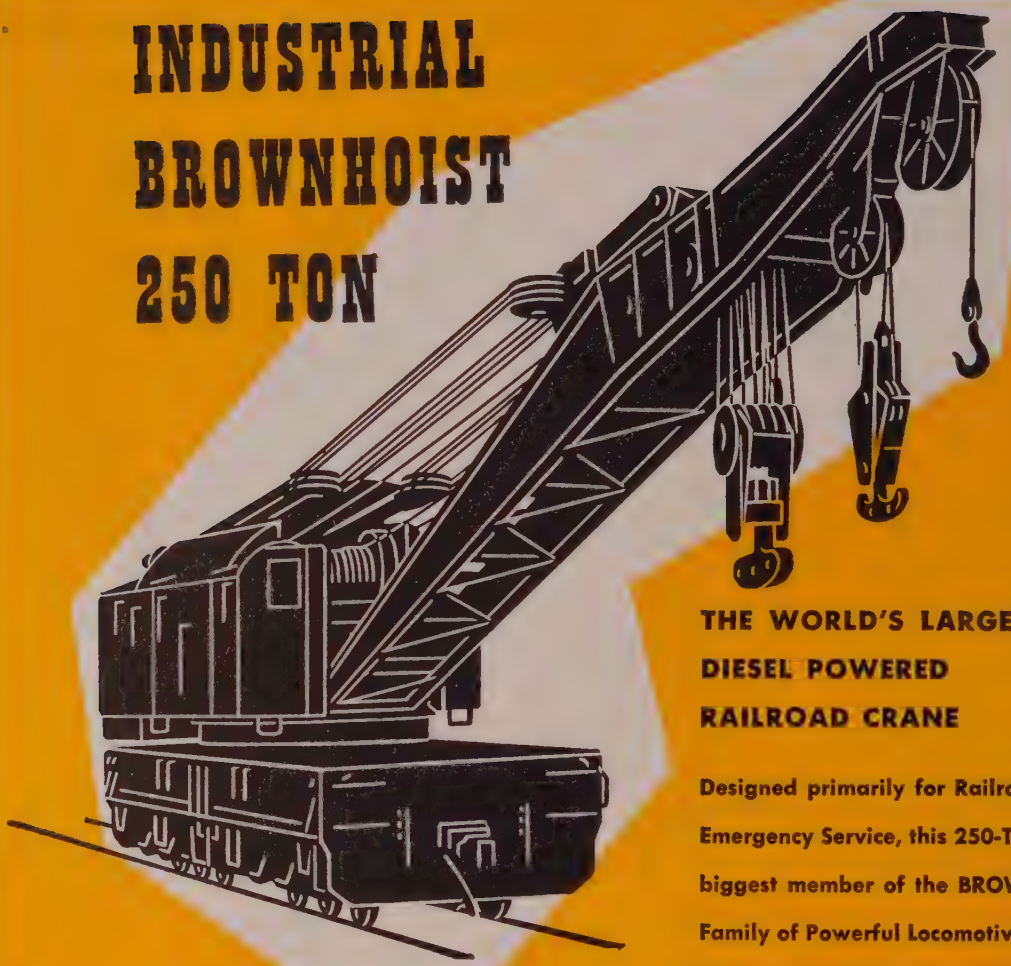


USS

NATIONAL Electric Welded MECHANICAL STEEL TUBING

UNITED STATES STEEL

INDUSTRIAL BROWNHOIST 250 TON



THE WORLD'S LARGEST DIESEL POWERED RAILROAD CRANE

Designed primarily for Railroad Emergency Service, this 250-Ton Crane is the biggest member of the BROWNHOIST Family of Powerful Locomotive Cranes For Heavy-Duty Materials-Handling Work.

Brownhoist Diesel Locomotive Cranes are ruggedly built for continuous, heavy-duty operation and for long, dependable service. They perform equally well as switch engine or crane and with magnet, hook or bucket. Many advanced features of engineering design and construction make BROWNHOIST Cranes easy to operate and inexpensive to maintain. Standard models to meet every capacity requirement. Write for complete information.

BROWNHOIST builds better cranes

CLAMSHELL BUCKET

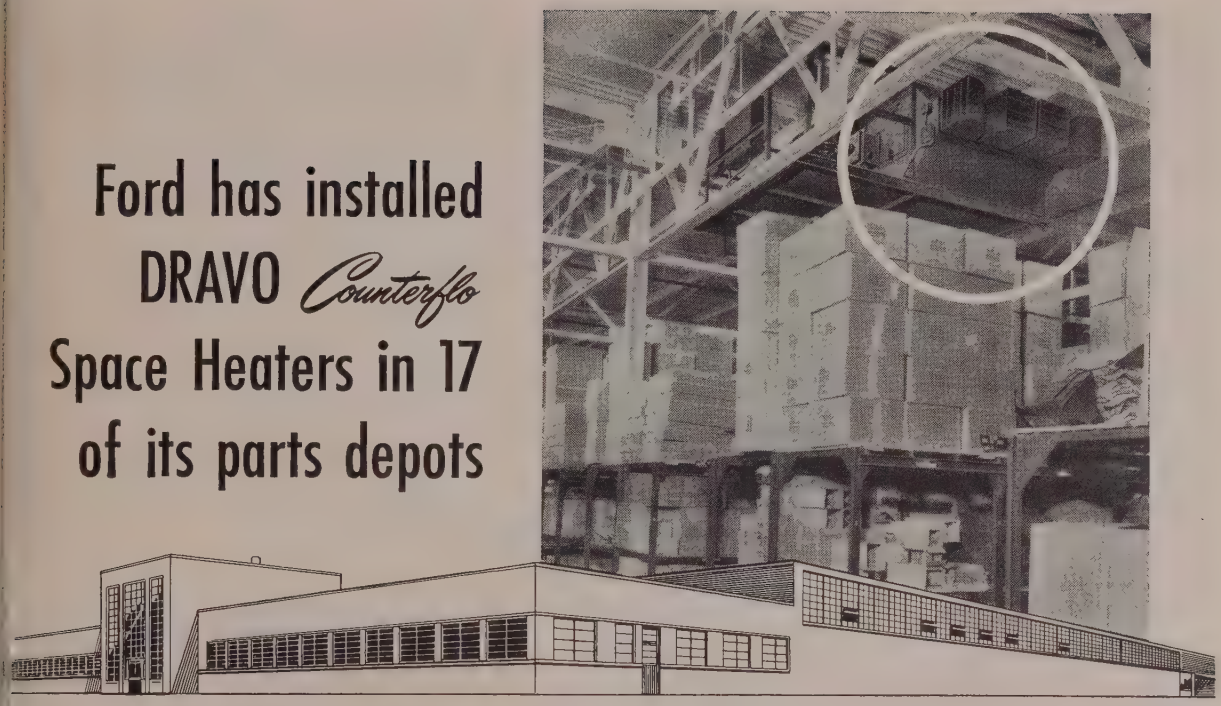
COAL-ORE BRIDGE

CAR DUMPER

INDUSTRIAL BROWNHOIST CORPORATION, BAY CITY, MICHIGAN • DISTRICT OFFICES: New York City, Philadelphia, Cleveland, San Francisco, Chicago; Canadian Brownhoist Ltd., Montreal, Quebec • AGENCIES: Detroit, Birmingham, Houston, Los Angeles.

158

Ford has installed DRAVO *Counterflo* Space Heaters in 17 of its parts depots



n planning the heating system for 17 of its parts depots in various parts of the country, Ford Motor Company wanted to:

1. Keep floor areas free for maximum storage
2. Heat large warehouse areas
3. Provide uniform heat throughout the area

Typical of the Dravo *Counterflo* Space Heaters installed by Ford is the one illustrated at its Cleveland Parts Depot. Dravo Heaters provide:

ADAPTABILITY—Dravo Heaters are mounted horizontally on overhead girders, 16 ft. above the floor, saving valuable storage space and allowing maximum use of the floor area.

PENETRATION—Dravo Heaters' high-capacity fans re-circulate the air completely throughout the 140,560 sq. ft. area in 25 minutes, despite the tiering of material in uneven heights. Directional louvres guide the flow of air. The area can be warmed quickly in winter and cooled easily in summer.

ECONOMY—Dravo Heaters are thermostatically controlled to keep temperatures constant. Installation cost was kept to a minimum, because no ductwork was required. Minimum efficiency is 80%. Roof heat losses are low.

These and many other advantages can be yours when you install Dravo *Counterflo* Space Heaters in your commercial or industrial building. Write for complete details. Use the coupon.

DRAVO
CORPORATION

PITTSBURGH • ATLANTA • BOSTON • CHICAGO • CINCINNATI
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DRAVO

Send me information about heating for the subjects I've checked, and Dravo Heater Catalog QR 523-24.

- ☐ Space heating industrial buildings, warehouses, garages, hangars.
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- ☐ Tempering make-up air.
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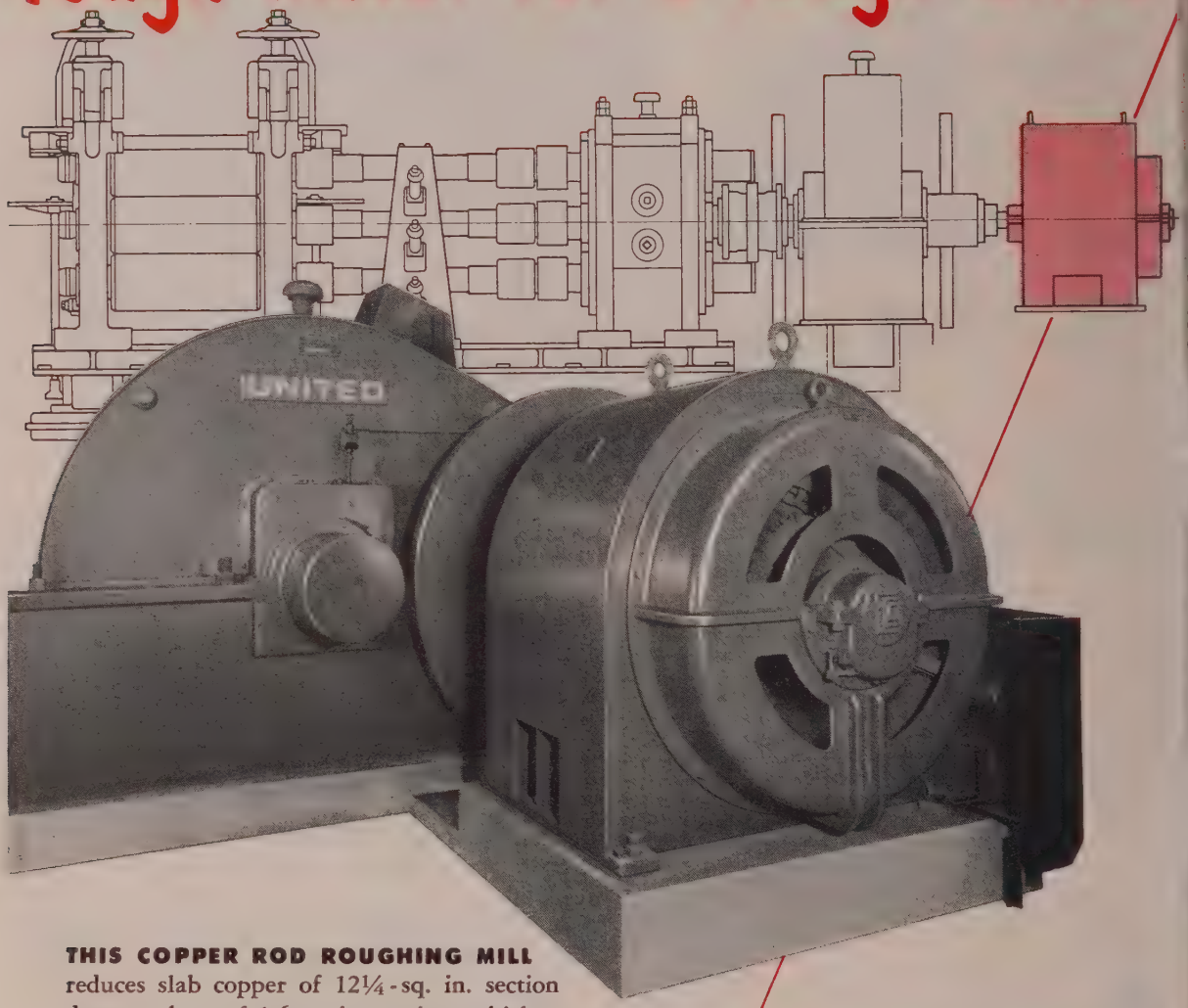
Tough motor for a tough drive



THIS COPPER ROD ROUGHING MILL reduces slab copper of 12¼-sq. in. section down to bars of 1.6-sq. in. section, which certainly ranks as rugged service, demanding a motor that can take shock and heavy current surges. The American Brass Company selected an Elliott motor to drive this new mill, built by the United Engineering & Foundry Company.

The motor is an 800-hp, 710-rpm Fabri-Steel wound-rotor induction motor, with a 300% pull-out torque, driving through gears with a ratio of 6.85:1. Elliott fabricated steel construction provides the rigidity and sturdiness required for this extremely arduous service.

ELLIOTT MOTORS

are widely recognized for their performance in heavy mill drive service. For full details on these motors in their various types, contact your local Elliott engineer, or write Elliott Company, Ridgway, Pa.

Elliott FABRI-STEEL

ELLIOTT Company

RIDGWAY DIVISION

FOR MOTORS 1-200 HP: CROCKER WHEELER DIV. AMPERE, N. J.

R3-19

AVIATION

owes this veteran furnace a deep bow

From this very furnace (and its fellows) came the special heat-resistant steels for aircraft engine exhaust valves that first let men fly an ocean: Lindbergh, Chamberlain, Byrd. From it and its successors in various A-L mills came the high-temperature alloys that made possible the first aircraft superchargers . . . and later, the first ventures into jet and rocket-propelled flight. ● Whenever *you* have a problem of resisting heat, corrosion, wear, or great stress—or of satisfying special electrical requirements—remember to see us about it, won't you? *Allegheny Ludlum Steel Corporation, Oliver Building, Pittsburgh 22, Pa.*

W&D 4147 B

PIONEERING on the Horizons of Steel

Allegheny Ludlum

AL
LEADING PRODUCER HIGH-ALLOY STEELS

Warehouse stocks of Allegheny Stainless carried by all Ryerson plants

Steel

The World's Largest Stocks

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Certified Quality—Carbon, Alloy, Stainless

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Fifteen Plants from Coast to Coast

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Metallurgists and Veteran Steel Men

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Sawing, Shearing, Flame Cutting

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Immediate Shipment

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RYERSON STEEL SERVICE

PRINCIPAL PRODUCTS IN STOCK: CARBON, ALLOY AND STAINLESS STEELS • BARS • STRUCTURALS • PLATES • SHEETS
TUBING • METAL WORKING MACHINERY AND TOOLS • GLYCO BABBITT METAL • RYERTEX PLASTIC BEARINGS

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • CINCINNATI • CLEVELAND • DETROIT
PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

Metalworking Outlook

Dynaflow Works Well

Engineers who have tested the Dynaflow transmission as adapted for the Cadillac confess they like it. There's speculation that it may be offered as an option hereafter even when Hydra-Matic production returns to a level which will enable that transmission to be installed in all cars built. Cadillac resumed production Sept. 8 as planned, just 27 days after the Livonia fire.

Architectural Markets Promising

Experts on aluminum believe that one of the most promising markets for the metal is in architectural uses—in siding, curtain walls and other applications for industrial, commercial and farm buildings and for homes. Stainless steel makers also look to that market to consume a lot of their product. Among new developments in aluminum that may have architectural uses is a process for bonding the metal to plywood. The technique is still not ready for commercial application. Aluminum is already being bonded to a reflective material for use on highway signs.

Caution: New Product

Thinking of bringing out a new product? Watch out. Of all the new products placed on the market every year, only 2 per cent make the grade and 98 per cent are failures. Dun & Bradstreet, the Department of Commerce and trade associations say the main causes for failure are lack of plan, lack of pretesting the product and the market. Pricing is the most important decision to be made in marketing a new product.

Big Source for Capital

Some $2.5 billion a year is being contributed to pension funds in private industry. Commerce Clearing House reports that 54 per cent of the money in 60 pension trusts it studied is invested in stocks and corporate bonds, 13 per cent in varied investments, notably mortgages, and 33 per cent in government bonds. Securities & Exchange Commission says that in 1952 private pension trusts bought about $1.3 billion worth of corporate securities, or 15 per cent of the $8.6 billion sold.

Good-by Pickax, Mule and Sourdough

Watch for a big surge in the development of new and improved prospecting instruments. Battelle Memorial Institute Director Clyde Williams says a great need exists for more fundamental studies on the distribution and relationships of elements in the earth's crust. New prospecting instruments can help in solving some of our materials shortages. Battelle believes that the miniaturization of commonly used geophysical instruments might lead to useful information in bore-hole analyses. Fundamental re-

search is needed in seismic and electrical methods of exploration to increase the accuracy and detail-recording power of present instruments. Electronic brains might also be adapted to the recording of geophysical data.

More Pensions, Less Overtime

Industry is seeking to keep its executives by offering higher pensions or annuities, rather than salary increases. Income after retirement is taxed at a much lower rate than the same amount would be if added to an already high salary. On the lower end of the salary scale, take-home pay is dropping a little, largely because company officials are reducing overtime to cut production costs. Since May, the average work week in the steel industry, for example, has slipped steadily.

BSDA Tries Again

The much delayed Business Services Defense Administration will this week probably finally succeed NPA in administering what's left of our materials controls. Legal and budget snarls have held up BSDA for more than six weeks. It will function as an agency of the Commerce department.

In the Saddle at FTC

Federal Trade Commission Chairman Edward F. Howrey is more firmly in the saddle as head of the FTC. One of the other commissioners, Stephen J. Spingarn, challenged his action in firing 40 commission employees, including four of its top economists. Mr. Howrey was upheld in a 3-1 vote. Voting for the move were Commissioners Howrey, Lowell B. Mason and John Garson. Commissioner Albert A. Carretta, who has usually been supporting the chairman, was absent. Democrat Spingarn's term expires Sept. 25. The chairman says the firing was done as part of an economy drive.

Straws in the Wind

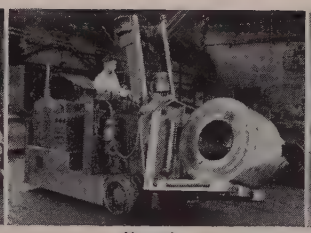
"Inventories of finished goods and those of our dealers have accumulated to a point out of relation to present demand," says John L. McCaffrey, president of International Harvester Co. . . . Purpose of Studebaker Corp.'s layoff of 5000 to 6000 workers and one-third cutback in production this week is "to decrease number of cars in dealers' hands," says Harold S. Vance, Sutdebaker president . . . GM's Chevrolet Motor Division will add about 160,000 square feet to its plant at Cleveland, with construction to start on the 16 per cent addition this fall.

This Week in Metalworking

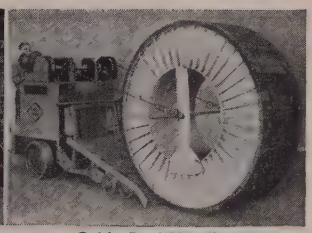
The oil and gas industry will spend $5.4 billion on expansion in 1953, to boom metalworking markets (p. 63) . . . John L. Lewis wants to boost royalty payments to 50 cents a ton for his miners' welfare fund as his union's membership drops (p. 64) . . . New plant and equipment expenditures will hit a record $27.8 billion in 1953 (p. 65) . . . Area development programs pay off for communities and industry (p. 66) . . . Air Force cutbacks will hurt industry eventually, but not much now (p. 69).

Die Handler

Pallet Retriever

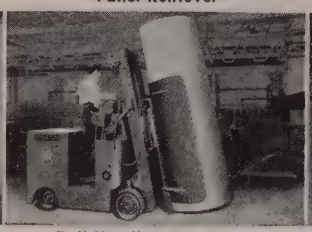


Upender



Cable Reel Handler

Side Dump Revolving Unit



Roll Handler with Apron

Tin Plate Clamp

Bale Clamp

Twin Coil Handler

Rotary Scoop

Roll Piercing Truck

3-Ton Low Lift; 1-Ton Crane

Roll Clamp

Special Crane

Carton and Drum Handler

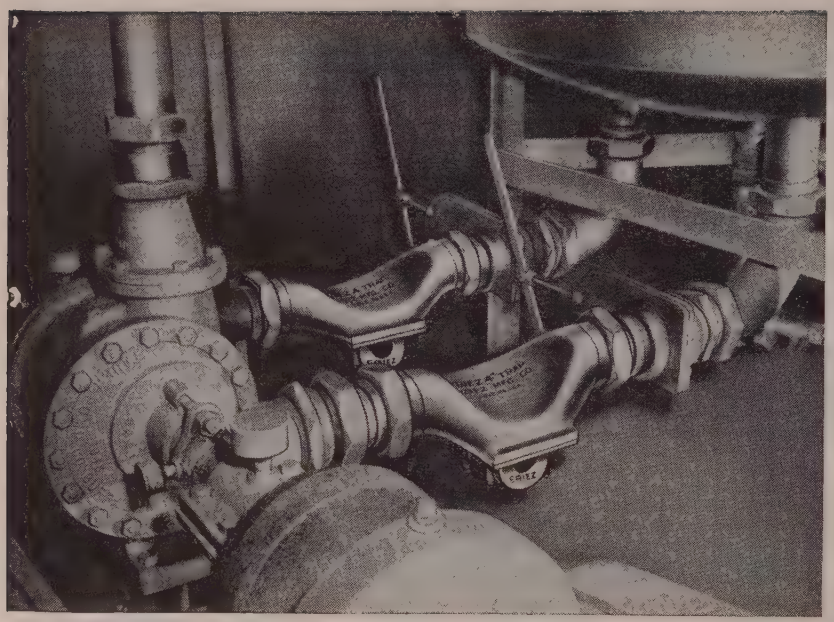
ELWELL-PARKER

trucks for every type of handling

Only a FEW examples of Elwell-Parker's ingenuity and enterprise in meeting unusual materials handling requirements are shown . . . Not infrequently, the peculiar shape or nature of a load makes a standard truck impractical. In producing attachments or units for such needs, Elwell-Parker draws on its 45 years of experience supplying power trucks for over 300 industries . . . From its line of 87 different sizes and types, Elwell-Parker can usually select a standard truck for the job. If not, ask your E-P man about a unit precisely suited to your needs. The Elwell-Parker Electric Co., 4192 St. Clair Avenue, Cleveland 3, Ohio.

NEW ATTACHMENT FOLDER describes and illustrates in detail the many attachments for E-P fork trucks. Write for your copy.

ELWELL-PARKER
POWER INDUSTRIAL TRUCKS
Established 1893



ERIEZ MAGNETIC PIPELINE TRAPS, widely used in the process industries, provide the superior magnetic strength of a high nickel alloy . . . ALNICO . . . to assure positive trapping of tramp iron. Housings are non-magnetic chromium-nickel stainless steel castings . . . leak-proof, easy to install and simple to clean. Completely non-electric . . . first cost is last cost . . . since magnets hold strength during life of equipment.

1,045 PIECES OF TRAMP IRON REMOVED ahead of vane-type displacement pump in food production line during a 30-day period, by an ERIEZ Permanent (non-electric) Magnetic Pipeline Trap.

Prevent

→ Machinery Damage
→ Product Contamination
→ Production Tie-Ups

. . . Automatically, with Eriez Magnetic Traps

Look at this pile of tramp iron . . .

Trapped ahead of a pump in a large food plant during a 30-day processing period . . . it exemplifies how "protection plus" is obtained automatically with pipeline traps produced by ERIEZ MANUFACTURING COMPANY, Erie, Pa.

To keep liquid flow lines free of ferrous materials ranging in size from minute particles to large pieces of tramp iron, ERIEZ pipeline traps utilize the strong magnetic properties of Alnico permanent magnets containing a high percentage of nickel.

Use of this aluminum-nickel-cobalt-iron alloy not only permits trap designs that eliminate need for electromagnets requiring current and accessory equipment, but its use also allows reduction of space and weight requirements to desirable limits.

The addition of nickel . . . an essential in Alnico . . . improves scores of other alloys utilized throughout industry. Consult us on use of nickel or nickel alloys in your products or equipment.

Send details of your metal problems for our suggestions.

At the present time, nickel is available for end uses in defense and defense supporting industries. The remainder of the supply is available for some civilian applications and governmental stockpiling.

EMBLEM OF INCO SERVICE

THE INTERNATIONAL NICKEL COMPANY, INC. 67 WALL STREET NEW YORK 5, N. Y.

From Core to Fringe

Recently the United States Census Bureau released an analysis of the increase in the number of dwelling units in the nation from 1940 to 1950. During this period the number of units increased 8,658,000 to a total of 45,983,000, of which 64 per cent were in the urban areas, 22 per cent in the rural, nonfarm areas and 14 per cent on farms.

Significantly, the increase in dwelling units in metropolitan areas was 28 per cent, compared with an increase of 17 per cent in all other areas. Within these metropolitan areas, the increase in units in the central cities was 19 per cent whereas in the suburban districts just beyond the central cities, the increase was 44 per cent.

These figures confirm a trend that has been sensed by many observers today, namely, that there is a growing migration from the congested downtown areas of large cities to the periphery of these cities. Important to the executives of the metalworking industry is that this exodus from the core to the outer fringes, which has been so pronouced in dwelling units from 1940 to 1950, is likely to be the pattern of industrial development during the forthcoming decade.

Already signs of this migration are multiplying rapidly. In almost every large city, old manufacturing establishments, which for years have been struggling vainly against downtown congestion and decadence, finally are moving into new plants in park-like surroundings in the outskirts. In most cases these moves are proving advantageous to management, employees, customers, suppliers and others concerned.

Also there has been a rather new tendency for some companies to jump beyond the suburbs and to build plants in rural communities—sometimes in places where there has been no industrial activity since grist mills and rake and basket factories were abandoned 90 to 100 years ago. Also, a few industrial corporations are moving their general offices from downtown skyscrapers to outlying suburbs or towns.

A thorough study of problems of plant location and of the distribution of industrial products probably would bring many improvements in the current manner of migration. It is a worth-while project for many companies.

E. C. Shaner

EDITOR-IN-CHIEF

SELECTING RIGHT SITES: In recent years the relocation of industrial plants has been facilitated to a certain extent by various agencies which are engaged in promoting the development of desirable areas for such plants. Railroads, public utilities, banks and real estate operators (p. 66) have been active in this field.

The usual pattern is for the promoting agency

to acquire a substantial acreage of land that is suitable for industrial development. Not only must this land be desirable from the standpoint of transportation facilities, labor markets and the other conventional factors, but it also must conform to certain rather rigid standards which are determined by the attitude of the inhabitants of the nearby communities.

During the past decade or two the officials of many municipalities have become very strict about facilities in the areas within their jurisdiction. This presents problems which must be considered carefully by companies which are contemplating relocation of their plants.

* * *

PUBLICIZE YOUR PLANS: Sometimes industrial companies are prevented from establishing plants in desirable locations by the opposition of people living near the proposed site. In a few instances the opposition is justified but in many other cases the protests of the citizens are based upon misunderstanding as to the character of industrial activity to be carried on in the proposed plant.

In recent years a number of companies have attempted to build research laboratories near residential sections. In some instances the plans of the companies have had to be altered or even abandoned because local authorities or citizens would not permit the land to be sold for industrial use. Usually refusal is based upon the fact that the people do not realize the difference between the appearance and operation of a research laboratory and those of a production plant. Often opposition of this kind can be overcome by intelligent public relations which inform the people properly of the company's plans.

* * *

GOOD LOOKING PLANTS: Today many metalworking plants of small and moderate size can be designed so that from the standpoint of external appearance, they compare favorably with the buildings to be found on a university campus. At the same time, building laws of some industrial communities are being altered so as to fulfill the requirements of well-designed plants which conform to certain standards of maximum height of building, set-back from street, and so forth.

Of course, industrial plants which involve certain chemical or metallurgical operations present special problems of their own, but there is no reason why the majority of manufacturing establishments cannot be designed, built and operated so that they are not an eyesore or a nuisance to the community in which they are situated.

* * *

INCONVENIENT, COSTLY: In the matter of efficiency of distribution of industrial products, it is quite certain that many facilities now in use are poorly located. In most of the nation's largest cities, numerous wholesale hardware dealers, mill supply houses and steel warehouses still remain in spots that were selected long before motor trucks became an important factor in the transportation of industrial products. In many instances the highway vehicles of these distributors lose scores of hours daily just waiting for traffic to clear on congested streets of the downtown city areas.

Now that manufacturing plants are moving from the cores of metropolitan areas to their outer fringes, it would seem that distributors of all kinds might re-examine their problems of efficient distribution. Perhaps a thorough analysis of mileage, hours, costs and other factors involved in the transportation of goods to customers would show that a surprising number of wholesalers, mill supplymen or warehousemen simply cannot afford to remain in their present inconvenient and inefficient locations.

* * *

MORE OIL AND GAS: While on the subject of distribution, it is well to remember that the oil and natural gas industries are doing a spectacular job of developing facilities that avoid the manifold troubles encountered in surface transportation. In the continental United States these oil and gas interests have built a network of 482,301 miles of underground pipelines. Of this total (p. 63), 314,000 miles of pipeline are employed in transporting natural gas and 168,301 miles are used for oil and oil products.

Pipeline mileage is likely to continue to expand for several years, as will other facilities for the production and distribution of oil and gas. It is estimated that in 1953 the capital outlay for the oil industry will total $4 billion and that of the natural gas industry will be about $1.4 billion. Most of this goes for products of the metalworking industry.

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Oil and Gas: From Their Growth Come New Markets

1953 Capital Expenditures for the Oil and Gas Industries
OIL INDUSTRY $4 billion GAS INDUSTRY $1.4 billion

These two industries will spend $5.4 billion for expansion this year—and there's more to come! Pipe and ancillary equipment makers have a big market potential

HUNTING FOR NEW MARKETS? Take a look at the oil and gas industries which will spend an estimated $5.4 billion in capital expansion and improvements this year.

The lion's share of that outlay will go to metalworking — for pipe and ancillary equipment, wells, processing plants and refineries.

Busy Underground—In just one phase of the thriving oil and gas industry operations — pipelines — the opportunities are immense. The pipeline network already burrows for 482,301 miles—314,000 miles carrying natural gas and 168,301 carrying oil and oil products. Pipe Line Contractors Association, Dallas, estimates that this year 8100 miles of pipe 12 inches and larger will be laid. The association estimates that cost for that pipe and ancillary equipment will be $290 million. In the next five years pipelines will continue to be an important source for metalworking income because some 27,000 additional miles of line will be laid, at a cost for the pipe and ancillary equipment of $945 million. At present Federal Power Commission has applications for more than 12,700 miles of pipeline construction from the gas industry alone.

A. O. Smith Corp., Milwaukee, believes that the bulk of the pipe to be laid this year and from now on will be in the big sizes, 16 inches and larger. It figures that some 7500 miles of the 8100 to be buried in 1953 will be in the large range and that some 3000 miles of pipe 16 inches in diameter and larger will be laid in each of the next five years, 1954 through 1958.

The Whole Story—Tubular goods for the oil and gas industries ac-

Movement underground: The 482,301-mile network continues to grow

count for 6 to 7 per cent of steel output in the country, American Iron and Steel Institute statistics show. Up to May, 1953, more than 2.3 million tons of pipe had been produced, and orders are still at a high level.

But pipe isn't the whole story for metalworking in a pipeline job. For example, pipe will cost only $9.5 million of the total $23.3 million tab for Colorado Interstate Gas Co.'s proposed 365-mile, 22-inch natural gas line. Installation will be $5.6 million; block valve installation $262,683; compressor station side gate installation $38,612; lateral side gates $3648; and river and highway crossings $322,464. The remainder of the total cost is for engineering, contingencies, surveying, coating materials, testing and cleaning.

Big Market — Pipelines are important, but they're only part of the market that the oil and gas industries afford metalworking. The oil and gas people use 19 per cent of the nation's total steel output, second only to automotive consumption of steel.

Total oil capital expansion this year is expected to amount to a record $4 billion. Gas expansion will hit nearly $1.4 billion, just short of the record 1951 expenditure of $1,461,500,000. American Gas Association forecasts the following capital expenditures in its industry for the next three years: In 1954 $1.1 billion, in 1955 $770 million and in 1956 $741 million.

Black Gold—Crude oil production set a new record in 1952 of nearly 2.3 billion barrels. In 1953 that output is expected to climb another 6 per cent to 2.77 billion barrels. Industry officials predict that by 1955 the nation's daily crude production will be 8.4 million barrels.

If oil well drilling in the second half of 1953 continues at the same rate as the first half, a record 47,000 new wells should be sunk. Last year the total was 45,985. Drilling is a big source of metalworking income because one rig to drill 10,000 feet takes equipment costing at least $300,000.

Plenty of Gas—The use of natural gas has doubled since 1940, and natural gas has fast supplanted manufactured gas in both industrial and domestic uses. Today more than 20 per cent of the energy used in this country is natural gas. Over 900,000 new customers were added by the industry in 1952, and it boasts more than 26.3 million users today.

While the oil and gas expansion offers a wide market for metalworking products, the most dramatic phase of the program—and many executives believe the most profitable—is the expanding "underground railroad" with its appetite for pipe and auxiliary equipment. The Pacific Northwest is a fertile area for new lines. Oil production in the Dakotas, Wyoming, Utah and Montana only recently got underway, and the battle has already begun for the natural gas market in that section.

Nosing its way into the water at St. Ignace, Mich., a 20-inch pipeline begins its four-mile trip across the Straits of Mackinac. Considered one of the outstanding feats of today, the crossing was accomplished by pulling the pipe across the bottom. Belonging to the Lakehead Pipeline Co., the pipeline will extend about 1700 miles from Superior, Wis., to Sarnia, Ont.

Competition — The pipeline expansion has brought competition. Crowding steel pipe producers are plastic and aluminum pipe makers. Already Republic Steel Corp. and Youngstown Sheet & Tube Co. have gone into commercial plastic pipe production by buying an interest in existing plastic firms.

The oil and gas industry provides a big market for metalworking. Are you ready to cash in?

Net Loss for UMW

UMW's welfare fund disbursed $139 million, only took in $13 million.

LATEST figures show John L. Lewis' United Mine Workers disbursed $138,963,950 in benefits through its Welfare & Retirement Fund in the year ending June 30, 1953.

That may hold the tip-off on UMW demands from mine operators this fall. The union's income for the same period was only $131,482,787—$7,481,163 less than was paid out. Chances are Mr. Lewis will stand pat on wage demands but ask for a hike of 10 cents a ton in royalty payments to the welfare fund.

A Plug—Such a demand, if met, would raise the welfare contribution by mine owners to 50 cents per ton of coal mined and plug the hole in union coffers.

Of the $139 million disbursed by the UMW, $59 million went as $100-a-month pensions to 50,055 retired miners, and $56 million in the form of hospital and medical services. Some 2.8 per cent of the total disbursement figure represented administrative costs.

Still the Key—Recent statistics which show a decreasing tonnage of soft coal production being done by UMW miners and an increasing tonnage by nonunion miners point up the drift away from the Lewis' union in the smaller, marginal mines. About 77 per cent of bituminous is union-mined now, compared with 83 per cent a year ago. But, the UMW still controls the key mines—large producers upon which the steel and manufacturing industries depend for their supply. Mr. Lewis thus still wields critical control over the nation's coal supply.

The fact that Mr. Lewis could have served contract termination notices on Aug. 1 and didn't does not rule out a work stoppage—for reasons only Mr. Lewis can dream up—later this fall. Watch for such a move when the weather turns for the worse.

Tactically Sound — Apparently Mr. Lewis will concentrate on holding the miners in the larger-producing mines through effective use of his welfare fund. Such tactics mini-

ize, but do not entirely cover up, ie loss of union membership in naller mines. Joseph E. Moody, esident of the Southern Coal Pro- ucers Association, has said that creases in wage costs have forced ie marginal mines to "the choice f closing down or of trying to perate nonunion."

If another 10 cents gets tacked nto the royalty payment, more ine operators will be pushed into he choice described by Mr. Moody. 'hat may soon pose this problem or Mr. Lewis: If welfare and oyalty payments are cut, control ver the larger mines will loosen, ut if welfare and royalty pay- ents are hiked, an increasing per- entage of mines will be forced to perate nonunion or quit alto- ether.

Kaiser Plans Big Expansion

Certificates of necessity for ac- elerated tax amortization for 128 ew or expanded facilities were ssued by the Office of Defense Mo- ilization from Aug. 13 through 26. Total cost of the projects amounts o $287,182,390.

Among the top three largest cer- tificates issued were three issued to Kaiser Steel Corp. for its steel plate facilities at Fontana, Calif. The certificates and the rate al- lowed were $31 million, 65 per cent; $17 million, 50 per cent; $4 million, 40 per cent.

French Batteries for the Navy

The Navy is about to install the first of 2000 new nickel-cadmium aircraft batteries imported from France.

Though about three times as ex- pensive as conventional lead-acid batteries, which have a peak endur- ance in aircraft service of about 100 hours, the French batteries are claimed to have a number of cost- offsetting advantages—such as 90 per cent more ampere-hour capac- ty, hermetically-sealed cells which never need refilling with water, elimination of hydrogen gas during recharging and a noncorrosive al- kaline electrolyte. Furthermore, each battery is expected to last the lifetime of the airplane in which it s installed. Nickel-cadmium bat- eries may be placed anywhere in he airplane.

NEW PLANT AND EQUIPMENT EXPENDITURES

	1952 (Millions of	1953 dollars)	Percent change
Manufacturing	11,994	12,690	+ 6
Durable goods industries	5,784	5,955	+ 3
Nondurable goods industries	6,210	6,735	+ 8
Mining	880	892	+ 1
Railroads	1,391	1,294	− 7
Transportation, other than rail	1,363	1,357	—
Public utilities	3,838	4,429	+15
Commercial and other	6,989	7,159	+ 2
TOTAL	26,455	27,821	+ 5

Capital Outlays Reflect Confidence

U. S. industry will invest $27.8 billion in new plant and equipment in 1953, about 5 per cent more than last year. Questionable fourth quarter shows a dip, but not a drop

CONFIDENT American businessmen will invest a record $27.8 billion in new plant and equipment this year despite the end of the Korean war and the return of the buyers' market in many quarters.

As early as June, it was apparent that predictions of $27 billion in capital outlays would be surpassed this year (see STEEL, Mar. 30, p. 45 and June 15, p. 53). But the fourth quarter investment rate was still questionable.

Now It's Known—Now, according to the latest survey of capital expenditure plans conducted by the Commerce department and the Securities & Exchange Commission in August, the third quarter, 1953, outlays will be at an annual rate of $28.4 billion and the final quarter rate will be $27.1 billion.

The last report shows fabricated metal products companies will be among those firms helping to raise the durable goods industries' 1953 investment rate 3 per cent over 1952. Nondurable goods producers expect an 8 per cent advance and manufacturing companies as a whole with outlays of $12.7 billion will average a 6 per cent increase this year over last as shown in the chart above.

Horns Still Out — Most major manufacturing groups report somewhat lower total capital outlays projected for the fourth quarter of this year (notable exceptions being electrical machinery producers and motor vehicle makers). But, it does not amount to a severe cutback and the over-the-year gain reflects a healthy business outlook going into 1954.

Electric Output Doubles

The electric utility industry of the U. S. will, by 1955, have more than doubled its generating capacity in a decade, says B. I. England, president of the Atlantic City Electric Co. In 1945, after more than a half-century of operations, output of electric energy totaled about 50 million kilowatts annually. When 1955 rolls around, electric utilities will have a yearly capacity of 115 million kilowatts.

To make this expansion possible, the electric utility industry spent $20 billion on new construction, a sum $7.5 billion more than the industry's entire investment in plant and equipment up to the end of 1945.

Concerning the future, Mr. England predicts consumption of a trillion hours by 1965. By then, he says, the average home will have color TV and automatic laundries, kitchens and climate controllers.

Area Development Puts the Welcome Mat Out for Industry

WOOING INDUSTRY still pays big dividends both to industry and to the community.

That's what the many U. S. communities say which have spruced up and actively courted new industry to come to their town. Here's what a few of those communities have accomplished:

Made jobs for 343,300 persons; added $1.5 billion in value of manufacture in New England.

Created 9000 new jobs in 39 firms and added $11.3 million in new annual pay roll in Wilkes-Barre, Pa.

Produced some 225 new jobs and a new $160,000 plant for Hillsboro, N. H.

Added about $1.8 billion in new plant and expansion since V-J Day; another $300 million in planned expansion or improvement added thus far in 1953 for Cleveland.

The movement, for that's what it is, to bring new industry and life to a community is called area development. A city or town doesn't have to be on the skids to feel the need for such development. Cleveland, after World War II, was a bustling metalworking town with no depression in sight. But a lot of former defense-work manufacturing space was due to be open. So, the Cleveland Electric Illuminating Co. began what has become its "Best Location in the Nation" campaign. CEI cited the results in the fourth example above.

Dug In — Other towns, like Wilkes-Barre, Pa., have found themselves a one-industry town, and that industry declining. In Wilkes-Barre it was the anthracite coal mining industry. In 1930, 61,114 mine employees produced 27.5 million tons of anthracite in area mines. In 1951, tonnage dropped to 14.9 million tons and mine jobs in 1953 are estimated at 27,850.

PITTSBURGH'S GOLDEN TRIANGLE
. . . *shining development example*

The Greater Wilkes-Barre Industrial Development Fund was formed in 1940 to help counteract the job trend. Through the use of a $350,000 fund in erecting new plants, the results cited in the second example above were achieved. In 1952 "Operation Jobs" was begun under leadership of a Committee of 100. Its efforts have brought 14 new industries to greater Wilkes-Barre and 12 established firms have expanded within 18 months.

This Way—How did they do it? The Committee of 100 raised $727,000 in free, unrestricted contributions for industrial development purposes. Vocational training facilities are being expanded to provide a pool of skilled workers. A choice 1300-acre tract is being developed into industrial sites. All segments of Wilkes-Barre have been enlisted in a drive to create

favorable atmosphere for industrial growth.

The key to the situation is: Favorable conditions already existed there or the possibilities were evident. Wilkes-Barre simply put its best foot forward.

Grass Roots Growth—Outstanding example of grass-roots area development spreading over a large section of the country exists in New England. Each of the six states has a commercial or industrial development commission. From these grow community credit organizations, survey commissions and local city and town industrial development committees. Within this framework and co-operating closely are the railroads, power companies and other public utilities, chambers of commerce, New England Council and banks.

Local volunteers, under the direction of the State Planning & Development Commission, rang doorbells in Newport, N. H., to uncover the exact size and composition of the town's workforce. They found Newport had a total available workforce of 480 of which 210 were unemployed. Of the 210, 85 had work skills of some kind. Newport considers this survey an important tool in cutting itself a slice of the new industry coming to New England. Newport people saw it work when nearby Hillsboro, N. H., got the sleek, new $160,000 plant of Comfort Slipper Corp. Hillsboro had to hump to assess its 2200 population for the available labor force. Newport is better prepared.

Hard Punch—Many other towns and areas have put on similar campaigns—Detroit, Birmingham, Los Angeles—and each can point to concrete and encouraging results. Industry, they found, likes to be wanted. Statewide campaigns do not seem to pack the same punch as these local efforts.

Pittsburgh, for example, gets an "A" for local effort in improving itself for its own citizenry and for attracting new businesses to locate here.

Taking Steps—In 1943 the Allegheny Conference on Community Development was started. Co-operating groups were the Pittsburgh Industrial Development Council, the Pittsburgh Regional Planning Association and United Smoke Council. Together these groups tackled the problems of poor traffic conditions, smokiness and general unattractiveness to new business.

Since March, 1952, when the Carlton House, Pittsburgh's first new hotel in 25 years, opened, four new downtown office buildings have opened, the $34-million greater Pittsburgh airport has been dedicated, two Public Parking Authority garages have been completed and a new traffic tunnel and parkway into Pittsburgh have been officially opened. Projected are the Mellon Square park, with a six-level underground parking garage, a second parkway and further Gateway Center development.

Counting the Assets—What has this meant to industry in Pittsburgh? Since 1947, basic steel producing companies have spent over $503 million in the Pittsburgh area. In that time, 250 manufacturing companies have started up in the four-county area. Westinghouse Electric Corp. spent $35 million locally and Pittsburgh Coke & Chemical Co., $34 million. General Motors Corp. built a new $20-million plant in West Mifflin, Pa., to make truck and car doors. Kelsey-Hayes Wheel Co. opened a $10-million plant in McKeesport, Pa., and Detroit Steel Products Co. and Ceco Steel Products Corp. are building plants in the area. New industrial research centers include U. S. Steel Corp.'s 132,000-square-foot center now under construction near Monroeville, Pa.

Industrymen like to see a town stretch out the welcome mat for them. In fact, local groups often help answer critical questions which finally decide whether a manufacturer will build or not build in their community. Ford Motor Co. says, in reference to its move into the Cleveland area, "We were very well pleased with the co-operative attitude of groups in Cleveland as we have been with groups in other areas of the country. We always want to be certain that our appearance in a community will not aggravate a lot of domestic problems."

So successful have been these local campaigns in providing suitable plant sites and a favorable atmosphere that some communities have gone too far, perhaps, to make themselves attractive. In those areas, industrial investment funds for building and equipment are underwritten by municipal or county governments. Usually such schemes arise where local conditions are not favorable for new industry under existing conditions. That twists a basic tenet of the area development movement. This is not an effort to sell a refrigerator to an Eskimo. This is a drive by local areas to discover and brush up their real advantages and resources and make them available to new businesses.

Such local communities are acting on their belief that U. S. industry is going to continue to grow. They're doing all they can to make themselves as attractive as possible to this new growth. And it's paying off.

CHECKPOINTS FOR AREA DEVELOPMENT

For a town:

Do you have adequate fire protection?

Are your taxes discriminatory against industry?

Are adequate electricity, gas, water and land for expansion at hand?

Are your streets adequate?

Will residential and commercial development keep pace with industrial growth?

Is the community as a whole receptive to new industry?

For a business:

Don't be enticed into a town through some special inducement when that town cannot support your business over the long haul. Too often you will find yourself paying exorbitant taxes later.

Does the local government favor industrial development?

Does the "community mind" favor your appearance as well as the promoter with whom you're dealing?

"Birthmarking" Progress

Timken's tryout of Air Force marking proposal wins consumer approval

ONE OF THE FIRST to "birthmark" some of its alloy steel is Timken Roller Bearing Co., Canton, O., and customers are well pleased with the practice.

Loudest acclaim comes from the Air Force which is trying to reduce its waste of critical materials resulting from "lost identity" of steel and nonferrous alloys. It's pushing for adoption by metalworkers of a uniform method of marking alloys, and the Defense Supply Management Agency is already working on a suitable system which will probably be completed around the first of the year.

Impetus — The "birthmarking" movement got its impetus after the AF had to sell thousands of tons of alloy as scrap following World War II because original markings had become meaningless. Identification by chemical and physical analysis of each piece would have been too costly.

The ideal setup would be uniform markings on materials right from the producer's mill through all channels to final consumption. Most of the trouble today comes from color analysis markings; many consumers have their own systems and order the producer to mark their shipments accordingly. Thus a producer has to mark one type of item two, three or more different ways, depending upon which customer is buying the product.

No Charge — Timken does not make an extra charge for its new marking system, although there has always been a certain charge for the usual end marking done at the request of the consumer.

Part of the trouble in the whole plan has been to get an efficient, economical method of marking alloys. Several companies have come out with various methods, and one of the latest is Schmutz Mfg. Co., Louisville, which announces a new machine using the offset printing principle.

Operation—"We're currently installing the first machine and production should begin this week," Julius Schmutz, president, told STEEL. "The machine will be used on tubular goods from ⅜ to 3-inch OD and will print simultaneously on four sides at the rate of 300 to 500 feet per minute."

Shells in a Hurry

Four months after being awarded a contract to produce 8-inch howitzer shells, American Car & Foundry Co.'s Berwick, Pa., plant had shells rolling off the line. A year had been expected to elapse before shells were rolling down the assembly line to be machined as shown here. Thirty-three operations are necessary to produce the projectile, which weighs 161 pounds without the powder charge

Crane Selects New Plant Site

Chattanooga, Tenn., will be the site of the new $25-million titanium plant of Crane Co., Chicago, H. H. Bunchman, vice president, announces. The 200-acre site is downstream two miles from TVA's Chickamauga Dam.

Production in the new plant is expected to get under way in late 1954 or early 1955. Between 20 and 24 large industrial-type units with about 500,000 square feet of floor space will be constructed.

Cramet Inc., a wholly-owned subsidiary of Crane, will operate the plant, and W. M. Hamilton, manager, states that about 1000 persons will be employed when the plant is in full operation.

Cramet's contract with the government calls for production of 30,000 tons of titanium sponge over a five-year period.

Taking Stock of Stocks

Existing contracts will be u touched, but the U. S. will slo down stockpiling

U. S. STOCKPILING of strateg materials will be slowed down du ing the current review of stoc piles, Defense Mobilizer Arthur Flemming announces. Existing O fice of Defense Mobilization co tracts will not be affected, but ne purchases will generally be limi ed to one year.

The new procurement directiv is aimed at insuring the most ad vantageous use of federal fund lessening the impact on industr of sudden withdrawals whe stockpiling of materials nears com pletion and preventing over-buy ing by the government.

Modified — Purchases of critic materials with top defense priorit will continue without interruptio but lower acquistion rates will b given to materials easily obtaine or where stockpiles are near com pletion.

Goals on all defense priorit items set for June, 1954, will b met, but low priority items will b moved back to June, 1955.

Speed for Some—In the case o critical materials in short supply the procurement program will pro ceed as rapidly as possible, ODM reports. To speed the stockpil objectives of some of these items additional expansion program will probably be undertaken.

Of the 76 materials on th stockpile list, ODM said that goal have been 75 per cent or mor completed on about 38 items. I fiscal 1954 it has been estimate that the stockpiling program wil cost about $800 million as com pared to last year's $912 million.

Senate Unit Studies Stockpiling

Allegations of "gross mismanagement and possible fraud" in the government's stockpiling program are being examined by the staff of the Senate Appropriations Committee.

Said Sen. Styles Bridges (Rep., N. H.), chairman: "If this is a fact, responsible persons certainly must be sought out and held accountable." Charges are that inferior materials were pur-

sed at the price of high-grade, t stocks of materials were lost ough mishandling or fraud, that ecifications were rigged so that ly one supplier was qualified.

tback Hits Dodge, Willys

An announced ordnance stretch- t plan will take a total of about 0 million worth of military truck d jeep business from Dodge Di- sion of Chrysler Corp. and Willys otors Inc. next year.

Brig. Gen. Carroll H. Deitrick, mmander of the Detroit Ord- nce Tank-Automotive Center, id deliveries of three-fourth-ton ctical trucks and ambulances m the Dodge truck plant at De- it would be cut from a $5-mil- n monthly rate to $3,150,000 arting in January, 1954. Dodge vision is sole producer of such my vehicles.

Willys Motors Inc.'s contracts for e-fourth-ton trucks and jeeps ill be cut from a $6-million onthly rate to $2,800,000 effec- ve next January.

efense Costs Summarized

Out of the $170.5 billion author- ed by Congress for the Depart- ent of Defense during the three- ear period following the attack on orea, only $12.5 billion remains be obligated.

Of the sum obligated, procure- ent and construction orders mount to $109.2 billion leaving 10.2 billion still to be used. A reakdown of this figure shows at hard goods orders total $97.6 llion with $6.5 billion yet to be laced. Soft goods contracted for mount to $11.4 billion, only $100 illion less than the authorization, nd with construction orders mounting to $6.8 billion, avail- ble funds of $3.5 billion remain this category.

Aircraft Out, Auto Bodies In

Construction of bodies for Ply- outh club and three-passenger oupes will replace the aircraft ull assembly operations at Chrys- er Corp.'s Evansville, Ind., plant arly next month.

The plant will complete its de- ense assignment of assembling ulls for the Grumman Albatross ir-sea rescue planes.

Aircraft Program Maintains Status Quo

Air Force, Defense officials assert present production schedules will be unaffected by cancellation of 956 planes. Most will come off the tail-end of the program

AIRCRAFT and component manufacturers will experience only minor effects in present production schedules as a result of the Air Force's latest cutback of 956 airplanes, but they may face less business in the future than they anticipated.

Most of the canceled aircraft were cut from the tail-end of the Air Force program and weren't yet under firm contract. Only 151 Boeing B-47 medium bombers had firm contracts; therefore, companies involved in the production of those planes will be about the only ones immediately affected.

CHARLES E. WILSON
. . . dollars freed for newer aircraft

Flameout—Probably the most definite impact will be felt by producers of the J-47 jet engine—General Electric Co. at its Evendale, O., and Lynn, Mass., plants, Studebaker Corp., South Bend, Ind., and Packard Motor Car Co., Detroit. Each B-47 uses six J-47 engines, plus replacements, so that means at least 1000 engines will be dropped. Eighteen other B-47s and 175 North American F-86 Saberjet day fighters, also powered by GE's J-47 engine, were canceled, but they were only on tentative production schedules. Money had been earmarked for them, but no firm contract had been issued.

About 404 Republic F-84F Thunderstreak fighter bombers, using J-65 Sapphire engines, were dropped from the end of the program, but those, too, were not under firm contract. The main effects of this probably will be that the two producers of the J-65—Curtiss-Wright Corp. at Wood-Ridge, N. J., and Buick Division at Flint, Mich., of General Motors Corp.—will complete their production of those engines sooner than they had thought.

Balance—The rest of the planes washed out by the Air Force order are 66 primary trainers, 141 basic trainers and 10 helicopters. All of those will be taken off the end of the program, also.

The Air Force has not announced what final disposition will be made with the approximately $1 billion which it says will be saved by the move. Secretary of Defense Charles E. Wilson said that at least some of it would be applied to more modern combat aircraft for which there is a more pressing need. He said also that the move originated within the Air Force itself and was not the result of any administration pressure to economize. According to Mr. Wilson, the action will not affect the current rate of production of 1000 aircraft a month.

Status Quo—Acting Secretary of the Air Force James H. Douglas stated that none of the canceled aircraft were needed for the interim Air Force goal of 120 wings or the 143-wing goal, should that be reconfirmed by the Joint Chiefs of Staff.

If new emphasis is placed on more modern planes, some of the producers cut back by the Air Force announcement will regain some of the loss. The successor to North American's F-86 is the supersonic F-100, for which the company already has a production contract. The successor to Republic's F-84 is the F-105, and the Air Force might decide to increase its orders for those.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor*

Bureau of Standards' Dr. Astin will deal only with scientific matters. The commerce secretary will take over in other areas to prevent new battery additive cases

ALTHOUGH Commerce Secretary Sinclair Weeks has reinstated Dr. Allen V. Astin as director of the National Bureau of Standards, he has also set up a system of safeguards to prevent further use of government powers to attach a fraud label to a manufacturer or his product without clear-cut proof.

As the system has operated in the past, the Federal Trade Commission and the Post Office department relied on the bureau for evidence to support the charge of fraud. The system came up before the Senate Small Business Committee for an airing last year.

The Spark—Triggering the committee's investigation was an FTC fraud charge against a small manufacturer of a chemical product claimed to rejuvenate and lengthen the lives of tired storage batteries. The manufacturer had also been denied use of the mails by the Post Office. Both actions had been taken on the basis of an old report of the bureau condemning battery additives generally.

One of Secretary Weeks' first big headaches to hit him in his new job last January was the battery additive case. The Senate committee reported that the fraud label had been attached to the manufacturer without scientific proof that his product was without value. It reported further that the bureau had been in the habit of getting information about specific products from private firms which might have a biased interest. It stated that attachment of a fraud label and denial of the use of the mails constituted a deathblow to this particular manufacturer—a power that, if unchecked, could put or threaten to put other small firms out of business without proof of fraud.

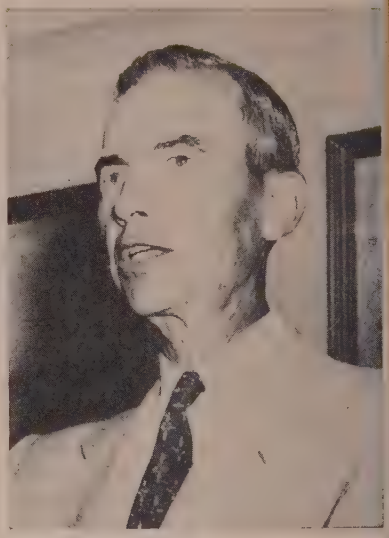
The Study—With the aid of a group of outstanding scientists, Secretary Weeks undertook a thorough investigation of the battery additive case. His main finding was that the battery additive manufacturer, irrespective of the value of his product, had shown no intent to defraud, and that without intent there can be no fraud. Mr. Weeks was instrumental in getting the FTC to close out its docket on the battery additive manufacturer and in getting the Post Office department to withdraw the mail ban. Now the battery additive man, who has produced evidence of hundreds of satisfied customers, is promoting the sale of his product actively. Even the Navy is trying it out.

The big news about Secretary Weeks' action with reference to the Bureau of Standards is that he has relieved the director of all jurisdiction in cases of this kind in the future. Dr. Astin, a competent scientist, is to direct scientific programs at the bureau. But all cases involving fraud charges against privately owned firms hereafter are to be handled personally by the secretary of commerce. He believes the power of the government should be used to protect the public against fraud. But he says he will see that no firm will be adjudged guilty of fraud and given a death sentence without ample proof.

U.S. Will Study Cuban Ore

With funds finally made available for prosecuting its long-delayed proposal to develop processes for the recovery of constituents of Cuban laterite ores, the Bureau of Mines will push this work on a large scale during fiscal 1954, using facilities at a number of its experiment stations.

The ore contains an average of 1 per cent nickel, 0.1 per cent cobalt, and 3 per cent chromium and comprises the largest reserve of such material in the western hemisphere; several billions of tons are readily available. In addition to nickel, cobalt and chromium, the bureau seeks a process to recover the iron.



Joins the Team

Donald A. Quarles, Albuquerque, N. M., joins Defense Secretary Charles E. Wilson's team as assistant secretary of defense for research, development

The Navy Gives Up in Alaska . . .

After nine years of exploring for oil in the Point Barrow, Alaska, district, at an expense of around $50 million, the Navy has terminated this program. It still is uncertain whether commercial quantities of petroleum underlie that region.

Plastics Gain in Ships

Metals steadily are losing ground to plastics as Navy ship construction materials. The trend to date is revealed in the current issue of *Research Review*, monthly publication of the Office of Naval Research, which discusses the following plastics applications: Boat hulls, shipboard piping, submarine fairwaters, minesweeper floats, shipboard superstructures, waveguides for electronic applications, sanitary plumbing fixtures, high-pressure gas storage cylinders, and ships' storage tanks.

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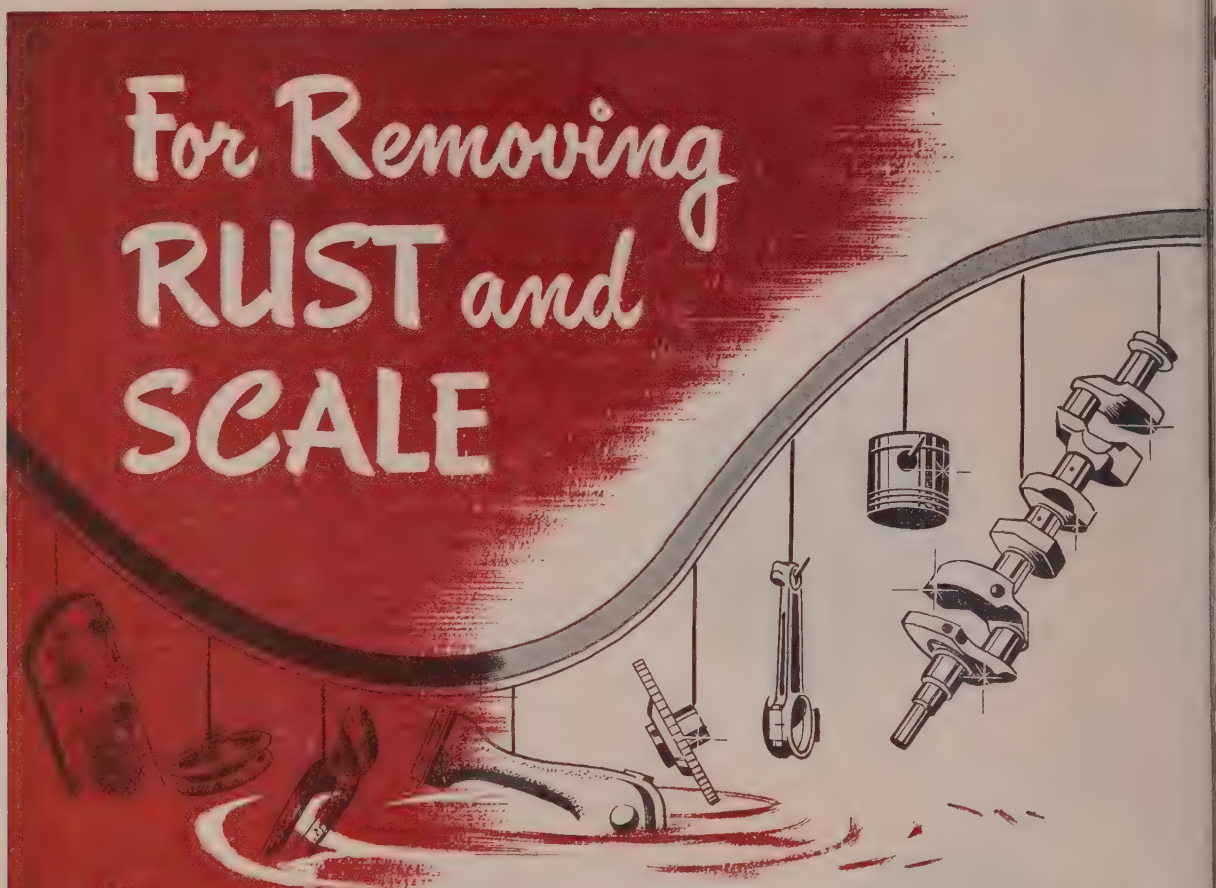

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European Industry Caught in the Doldrums

Encouraging production figures are hard to find among European metalworking industries. Belgium is typical. The summer lull accounts for part of slowdown

METALWORKING on the European continent has hit a summer lull. At least, that's what Europeans are hoping the slump is.

Take Belgium for example.

Waiting—Steel production dropped to 360,800 tons in July from 434,500 tons in June, 405,900 tons in May and 440,000 tons in April. Blast furnaces in operation numbered 50 in January and February, decreased to 49 in March and 47 in May. A recently completed new furnace installation in Charleroi-Mons will not start operating until the trend of the market is confirmed.

Metalworking industries are working at about 90 per cent of capacity, where 80 to 85 per cent of capacity is regarded as the point where output would equal orders at the current rates. On the export market, June orders booked represent only 65 per cent of shipments.

Dropping — Metalworking employment in Belgium dropped on a monthly average from 168,492 in January to June, 1952, to 165,798 in June to December, 1952, and to 161,067 in January to June, 1953. June, 1953, metalworking employment stood at 158,944. Similarly, both home and export orders to metalworking industries dropped in these periods. Home orders gave ground reluctantly, averaging monthly 2.49 million Belgian francs in January to June, 1952, 2.61 million Belgian francs in June to December, 1952, and 2.38 million Belgian francs in January to June, 1953. Exports orders slipped from 1.79 million Belgian francs, January to June, 1952, to 1.42 million Belgian francs, June to December, 1952, to 1.14 million Belgian francs, January to June, 1953.

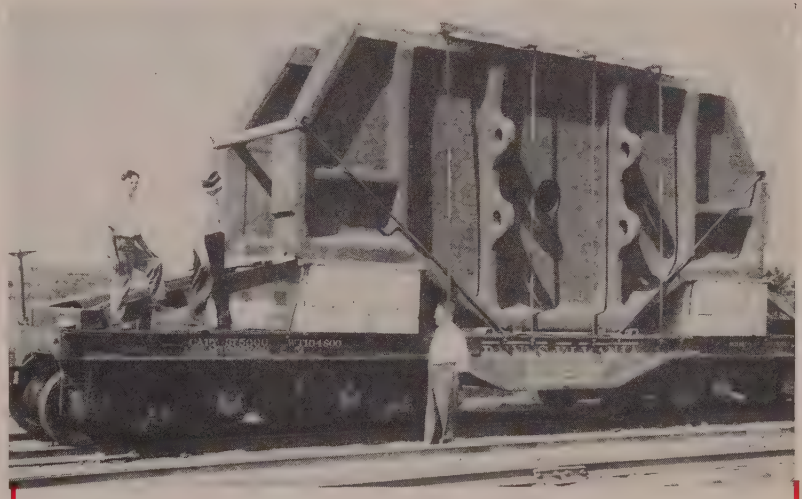
Foundries are among the worst hit of the metalworking trades. Foundries working at 30 per cent to 50 per cent of capacity are common.

Worrying—In general, the situation is not so bad as it was during 1949-1950. But, Europeans are concerned. The Korean war's end has led to some confusion on world markets, which will in turn straighten out, and the summer holiday season accounts for some of the drop in metalworking activity.

But, the biggest question mark is the United States. The hope is that decreased U. S. requirements following the Korean war will not stay depressed too long.

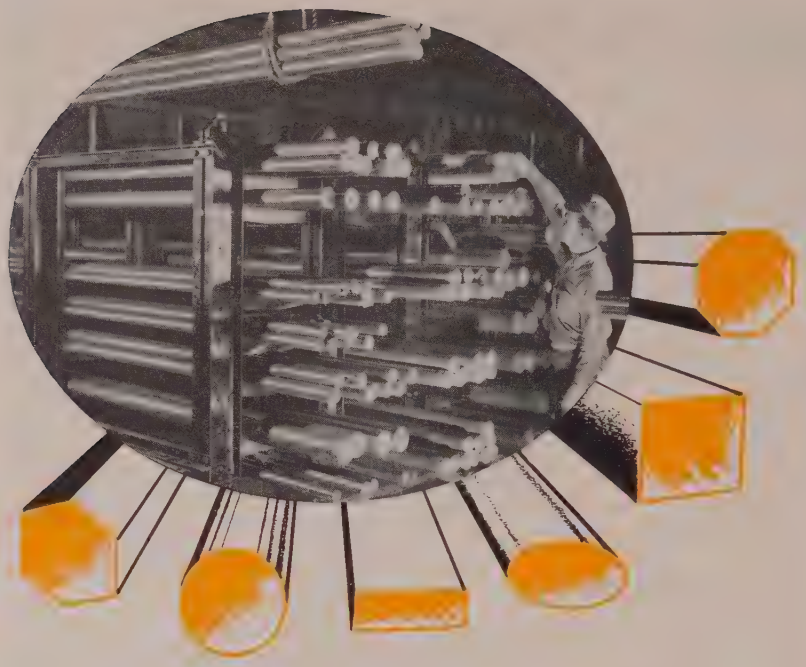
Export-Import Notebook

A special issue of the *Belgian Trade Review,* published by the Belgian Chamber of Commerce in the U. S. Inc., includes information on the modern installations at the steel plants of Western Europe as well as descriptions of each of the 19 steelmakers in Belgium and Luxembourg. Included in the latter are a complete listing of the blast furnaces, rolling mills and other steelmaking facilities in operation, together with production capacity data and product lists . . . British steel output in July averaged 276,600 tons a week, highest ever recorded for July. The U. K. auto industry broke all records in July for car production with a weekly average of 13,200 units. . . During the first half of 1953, West Germany has delivered to China 9200 tons of heavy steel plates, 4100 tons of medium plates, 6400 tons of sheets, 8800 tons of joists, 3400 tons of hoops and 2700 tons of wire rods. . . Under an Argentine-German trade agreement signed July, 1953, the two countries will exchange goods in each direction to a value of $136.6 million. Argentina's contribution: Wheat, rye cereals, hides, wool and linseed oil. Germany's contribution: Iron and steel products, chemicals, machinery parts, scientific and surgical instruments and capital equipment.



Heaviest in England and in New York

Heaviest single object ever imported via the Port of New York, this 414,000-pound casting is on its way from Sheffield, England, to South Charleston, W. Va. There it will be machined by the U.S. Naval Ordnance Plant for installation as part of a 50,000-ton hydraulic press designed and being built by Loewy-Hydropress Inc. for the U.S. Air Force at the Wyman-Gordon Co. plant in North Grafton, Mass. The casting is also the largest piece of metal ever cast in the British Isles. English Steel Corp.'s Sheffield foundry poured the part, moved it to Liverpool by special trailer. Only the giant hammerhead crane at the Brooklyn, N.Y., Navy yard could lift it from the hold of the S. S. American Packer to a special 16-wheel Pennsylvania Railroad flatcar. Solid oak blocking formed a bed for the casting on the flatcar which was held by ¾-inch thick, U-shaped channel irons and 1½-inch steel tie-rods



Large Carbon Bars: The Pinch Is Easing

END of the shortage of large carbon steel bars is in sight!

The thaw is stemming from reports the military shell program will be reduced 50 to 60 per cent in the first quarter of next year.

In preparation for such a cut, participants in the program are already canceling fourth-quarter orders so they will not go into the first quarter with inventories higher than necessary.

Can't Go On Forever—While the government has not officially announced such a reduction in the shell program, it has been generally recognized that with the Korean war ended, full production of ammunition would not go on indefinitely. When ammunition is not being expended it is only a matter of time until stockpiles are filled up.

Now, participants in the shell program are getting prepared for a reduced rate of output and want to have on hand only the bars needed for the job at hand (see p. 104).

For the last few months, small carbon bars, particularly sizes under 1.5 inches in diameter, have been in relatively easy supply. They are not used in any great amounts in the shell program.

In addition to the needs of the shell program, the supply of large carbon bars has been crimped by the heavy demand for seamless tubing and light structural shapes. Billets, large bars and tube rounds are interchangeable in varying degrees on most bar mills, structural mills and rail mills, but a heavy demand for light structurals and tube rounds has not left any slack either in rolling time or raw steel supply for large carbon bars.

Widespread Effect—Reduced military demand for large hot-rolled carbon bars for projectiles would be felt also in other areas of the steel market: 1. Supply of large cold-finished carbon bars would expand. 2. Alloy steel bars, already in easy supply, would become easier. 3. Supply of tube rounds and light structurals would increase. 4. Supply of steel ingots could increase slightly. 5. Patterns of steel bar buying would change.

The supply of large cold-finished bars would increase because there would be more hot-rolled bars to make them from.

Alloy bars would become easier in supply because some consumers who have substituted this higher priced material for large carbon bars would revert to the lower-priced carbon stock.

Supply of tube rounds and light structurals could increase if they weren't crowded off the mills by projectile steel rollings.

Supply of steel ingots could increase slightly if projectile steel were made in smaller quantities. Because great care must be exercised in making the high quality needed for projectile steel the yield of it is lower than of steel going into merchant quality bars.

A change in patterns of buying steel bars, and even other products from large bar mills, would emerge if buyers found they could always get all the tonnage they needed from the closest mill. No longer would they be willing to pay freight from mills farther away just to get material.

Not Alone—Slackening in the military shell program may not be the sole lifter of pressure from large carbon bars. Easing in demand from other quarters may play a part too. Already a general air of conservatism in steel buying is evident.

Any shortage of bars is felt widely, bars being the most universally used of all of the forms of finished steel. Also, the number of producers of hot-rolled bars and bar-size shapes exceeds that of any other form of finished steel. There were 64 on Jan. 1, 1951, the most recent date for which a count has been published by the American Iron & Steel Institute.

Production of carbon, alloy and stainless hot-rolled bars (including light shapes) and cold-finished bars in the first half of 1953 totaled 6,317,610 net tons, the institute's reports show. Of that total, 5,079,862 tons were hot-rolled bars and light shapes, making them the second most important product tonnagewise.

Most important product tonnagewise in the first half was cold-

rolled sheets, its output being 5,624,609 net tons.

Gains, but Loses—While the production of bars has increased tonnagewise over the years, it has declined percentagewise as the light flat-rolled products ascended in importance. In the first half of 1953, hot-rolled steel bars and light shapes constituted 12 per cent of the shipments of finished steel from mills. In 1905, when the total output of finished iron and steel was 18,860,817 net tons, of which 4,024,833 tons were merchant bars, the latter comprised 21 per cent of the total. By 1930, the percentage had slipped to 14. Then, merchant bar output accounted for 4,627,810 net tons of the total finished iron and steel production of 33,054,568 net tons.

A Look at Capacity—Although the steel industry has not been able to satisfy the demand for some sizes of hot-rolled bars, its over-all capacity as of Jan. 1, 1951, to produce hot-rolled bars and light shapes was in excess of the annual rate of output in the first half of 1953. The 1951 annual capacity was 12,890,170 net tons. Production in the first half of 1953 was at an annual rate of 10,159,724 net tons. There is little doubt that the present capacity exceeds 1951.

Similarly, current capacity for cold-finished steel bars is said to exceed that of Jan. 1, 1951, when 41 companies had a total annual capacity of 2,968,395 net tons. Output in the first half of 1953 was at an annual rate of 2,475,496 tons.

Biggest User of Bars—As might be expected, the automotive industry is the largest user of bars. Of 8,111,683 net tons of hot-rolled bars and light shapes shipped from mills in 1952, 2,124,506 tons went to the automotive industry. Next biggest chunk, 1,306,133 tons, went to warehouses for distribution to the myriad of small consumers. Only by a slight margin was the automotive industry the largest user of cold-finished bars in 1952. It took 395,886 of the 1,922,205 net tons shipped from mills. Close behind was the machinery industry, which received 316,242 tons. Eclipsing both of these was the amount that went to warehouses, their take of cold-finished bars being 536,311 tons.

Heat Treaters Going at Full Tilt

High costs, low selling price have them worried about possibility of cutting to a three-day week

"IF THE TIME COMES when heat treaters have to cut down to a three-day week, I'm fearful of what will happen," says an executive of a Cleveland commercial heat treating shop. And that's despite the fact that business in an estimated 350 commercial shops this year will reach about $60 million, or equal to the banner year of 1952, according to Metal Treating Institute projected figures.

While costs have risen in the commercial heat treating business just as in all others over the past ten years, the price of this essential metalworking service is practically what it was a decade ago. The Cleveland businessman went on to say, "Per dollar invested, profit is lower than in almost any other branch of metalworking. The only way job shops can break even or make a profit is by running full tilt." Full tilt is five days a week, 24 hours a day. Anything less than that entails cutting back furnaces and the costly and time-consuming reheating process.

Crucial Year Ahead—Some executives believe the break may come in 1954 as captive shops do more of their own work and pass less of it on to job shops. Until that bridge is crossed, however, heat treating shops will continue to turn out a long list of products.

Over the past dozen years or so, research—most of it by the big steel companies—has added many new products to that list. As G. R. Cox, plant engineer for Pittsburgh Commercial Heat Treating Co., Pittsburgh, says, "I never know what's coming into our office, there are so many items."

Small Business — Much of the sustenance of this industry comes from its larger industrial brothers. Many manufacturing plants have their own heat treating equipment, but in most cases it is used for run-of-the-mill work. Many materials requiring special heat treating is jobbed out to the smaller commercial plants. That is why the commercial industry today is doing much more business than ten years ago. But at the same time it is doing a lower percentage of all work done. At present, best estimates place 5 per cent of all heat treating in job shops.

The industry has grown in numbers as well as dollar volume. Typical is Cleveland, which had three shops before World War I, about a dozen before World War II and 30 early this year. One of New York's largest jobbers estimates that today there are about 5000 heat treating furnaces of all sizes in the U. S. About half belong to the 75 members of the Metal Treating Institute.

Matter of Economics—The number of active furnaces now is probably down from the peak reached during World War II. Reason for this, says one jobber, is that many customers went to doing their own heat treating.

Chester G. Sensenich, president of Irwin Foundry & Mine Car Co., Irwin, Pa., says it is much more economical to do his own heat treating. "We may have one unit to build, and we need one special die. We can make the die ourselves for $100 where it would cost us $500 to have it made elsewhere."

S for Service—With the cost problem being what it is, the return of competition has posed a real problem for heat treaters. Jobbers can't cut prices. Quality is uniformly high, and nobody wants to lower it to cut costs. They can and have increased sales efforts. But as one heat treater says, "Service—with a capital S—is our only effective weapon."

Heat Treating Sets Hot Pace*

1948	$10,830,000
1949	8,790,000
1950	12,740,000
1951	24,930,000
1952	30,700,000
1953†	30,000,000

*Work done by reporting members of Metal Treating Institute, whose membership does approximately 65 per cent of heat treating business.

†Estimated

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HIGH-TENSILE STEEL

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Photographs show effects of atmospheric corrosion after six years' exposure of unprotected surfaces.

1. Low carbon sheet steel showing friable heavy rust.
2. Low carbon sheet steel with rust removed showing heavy pitting.
3. N-A-X HIGH-TENSILE sheet steel showing tightly adhering rust.
4. N-A-X HIGH-TENSILE sheet steel with rust removed showing absence of excessive pitting.

Low carbon sheet steel lost four times more weight than N-A-X HIGH-TENSILE in six-year test. With increased time this ratio becomes greater.

N-A-X HIGH-TENSILE, having 50% greater strength than mild carbon steel, permits the use of thinner sections—resulting in lighter weight of products. It is a low-alloy steel—possessing much greater resistance to corrosion than mild carbon steel, with either painted or unpainted surfaces. Combined with this characteristic, it has high fatigue and toughness values at normal and sub-zero temperatures and the abrasion resistance of a medium high carbon steel—resulting in longer life of products.

N-A-X HIGH-TENSILE, with its higher physical properties, can be readily formed into the most difficult stamped shapes, and its response to welding, by any method, is excellent.

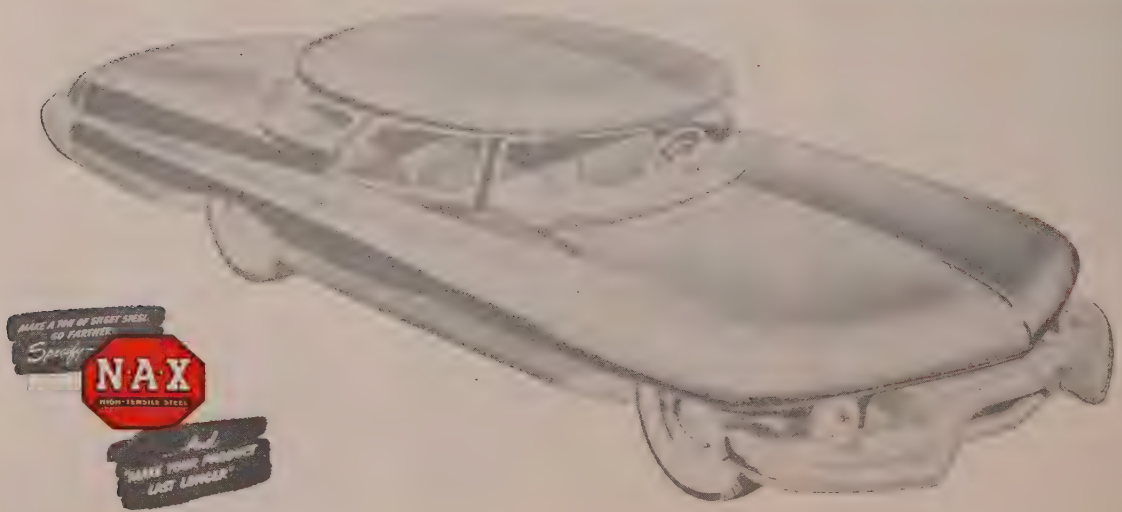
Due to its inherently fine grain and higher hardness, it can be ground and polished to a high degree of lustre at lower cost than can mild carbon steel.

Your product can be made lighter in weight . . . to last longer . . . and in some cases be manufactured more economically, when made of N-A-X HIGH-TENSILE steel.

GREAT LAKES STEEL CORPORATION

N-A-X Alloy Division — Ecorse, Detroit 29, Michigan

NATIONAL STEEL CORPORATION

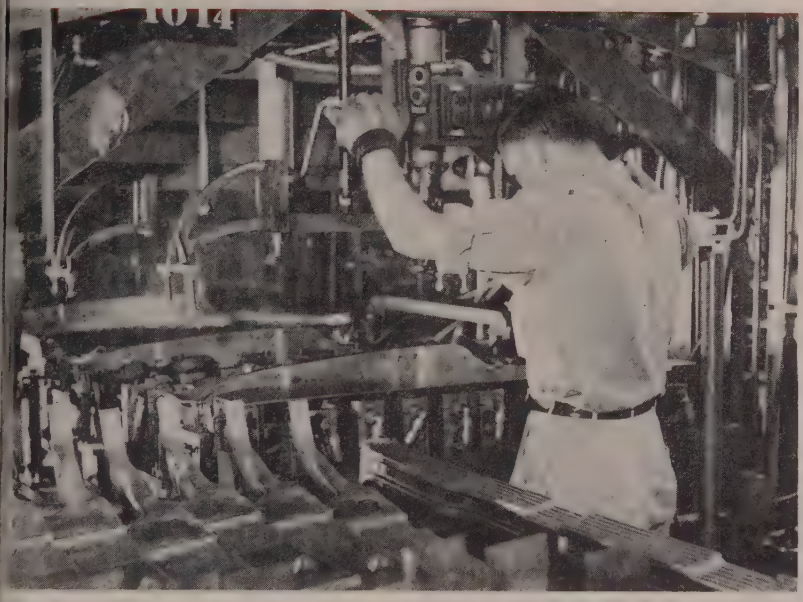


MAKE A TON OF SHEET STEEL GO FARTHER
Specify
N·A·X
HIGH-TENSILE STEEL
And
MAKE YOUR PRODUCT LAST LONGER

KEEP YOUR SCRAP MOVING TO YOUR DEALER

FLOYD G. LAWRENCE *Detroit Editor*

Mirrors of Motordom



Both hands on release buttons—symbol of auto plant safety . . .

The Livonia fire obscures the fact that the auto industry has one of the best safety records in the country. Here are safety rules it follows

DETROIT

THE GENERAL MOTORS' Livonia conflagration does not appear likely to set the safety world on fire.

But hard at work applying the torch are such groups as the National Fire Protection Association which cites four counts of "fire protection weakness." According to NFPA, undivided area in the plant was too large, sprinklers were inadequate, steel beams should have been shielded from the heat and an oxyacetylene torch was carelessly used.

It Could Be You—Unquestionably these elements were factors, and undoubtedly much will be learned from Livonia to help prevent a recurrence of the disaster. But despite cries of alarm and innuendoes of negligence, off-the-record interviews with safety men of several auto companies indicate that the same thing which happened to GM is a remote possibility in comparable facilities of any manufacturer.

"There probably will never be another disaster comparable to Livonia among the auto companies," says one safety expert, "but the odds were probably only about 1 in 4 million that it would have happened at GM. The Detroit transmission plant was the victim of a chain of circumstances."

Matter of Economics—Safety men, of course, deal in chains of circumstances. The feeling of these men for General Motors is predicated on the fact that safety is a relative matter and that chains of circumstance can never be eliminated with economic feasibility. A plant could probably be built 100 per cent accident proof, but economics are against it.

Modern plant design favors enclosing large areas without fire walls and concrete beams which require additional supporting columns. Equipment in such a plant has great positioning flexibility for smooth work flow, and changing from one job to another requires a minimum of time and effort. Despite pressure to the contrary, plants of the Detroit transmission type are proving their soundness of design from a manufacturing standpoint, and there are no indications that the auto companies will abandon the trend as competition begins to stiffen.

They Do All Right—But don't stay awake nights worrying about auto workers. In 1952 the frequency of accidents in the auto industry was only 3.62 per million man-hours compared with an industry average of 8.40. You're safer in the auto industry than in any other except communications and electrical equipment. And a glance at the figures in the table below might prove interesting, too. National Safety Council figures show that workers in smaller plants have a high accident frequency which tends to increase as the size of the companies diminish.

The significance of these findings is that plant safety today is more than a pair of dusty safety goggles hanging on a grinder. Perhaps a look at the other side of the coin, safety in the auto plants, will prove suggestive as well as helpful in restoring the perspective eclipsed by the sensationalism of Livonia.

At the Start—Safety in the auto plant in the last analysis is the responsibility of the plant engineer. In the design and layout of the equipment fundamental conditions of safety or hazard are set up. One important factor in improving equipment is the Joint Industry Conference composed of major au-

INJURIES IN INDUSTRY

Injury Frequency Rate Per Million Man-hours Worked*

Number of Employees	Frequency of Accidents
under 25	25.9
25 to 49	21.4
50 to 99	17.4
100 to 199	18.2
200 to 499	12.3
500 to 999	11.8
1000 and over	9.2

* Any work-incurred injury or disease that keeps an employee off the job permanently or temporarily.

Source: National Safety Council

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tomotive companies, machine tool builders and industrial equipment users. As a result, new and improved methods of building and installing electrical, hydraulic and pneumatic components on machine tools evolved as the JIC standards.

Guarding of equipment is another important consideration in the auto plants. Many small employers believe that the cost of safety devices is excessive for such equipment as small presses, or that production goes down when safety devices are installed. In one auto company a grill-type guard is individually designed for each die. This makes it practically impossible for the operator's hand to come between the dies.

Pay-Off—In use on 700 small presses over nine years, only one serious injury had been reported as of last year. Not only has the hazard to small press operations been practically eliminated, but instead of a loss in production there have been substantial gains in production all along the line. In the case of larger presses, automatic feeding and ejection equipment is being developed. Often this means redesigning dies with ejection pins, locating pins, etc. But once again production has gone up and the plant has worked over 8 million hours without a single lost-time accident on over 2100 presses, both large and small.

The development of automation equipment generally has added to the safety of the auto plant. The worker increasingly is being removed from the area where the work is taking place. As automation grows machines that have been fool-proof become idiot-proof and safety increases.

Acid Test—Most auto plant safety men agree that "idiot-proof" equipment has gotten the acid test as automakers scrape the bottom of the labor barrel. But the accident rate of many auto companies has stayed down or even decreased despite limited worker selectivity. Growing understanding of the worker and building sound safety habits are as important as equipment in bringing about this result.

In most plants a carefully presented safety orientation is given each worker when he is hired. Often a special list of safety instructions for each job in the plant is prepared in addition to the normal safety regulations. The worker is required to learn these regulations and is checked out on them by his foreman. Frequently the foreman is required to devote a small amount of each day to informal safety talks with employees. Physical limitations which constitute a hazard to a given worker on certain jobs are noted in assigning him in the plant.

That's an Order — But perhaps most important, safety instructions are not pleas—they're orders. The day of the foreman coaxing workers to wear safety glasses, for example, is fast disappearing. If a job requires safety glasses, they are worn. In fact, a growing number of plants are moving to 100 per cent eye protection. Everyone wears them in the plant from the president to the sweepers and that's that.

Follow-up is important in plant safety, too. When an accident occurs, a careful investigation of the circumstances is made and steps are taken to ensure that the accident will not recur. Bulletins are often used to describe the circumstances to all concerned, and each foreman is asked to check to be sure that similar conditions do not exist in his area.

Basic—The three fundamentals of modern plant safety, then are: 1. Engineering as it relates to proper safeguarding of machinery, equipment, materials and working conditions; 2. education of the worker with proper preparation of the employee to work in the plant and department, instruction of the right way to perform tasks; 3. enforcement of safety regulations to sustain safe working conditions.

Fire prevention is only one element of plant safety. An occurrence such as the Livonia fire obscures the thousands of accidents that do not happen thanks to intelligent safety planning. Its significance is the fact that any safety program, no matter how excellent, can still be improved.

How About You? — Does your plant have a vigorous safety program? The auto companies have found it pays, and their safety engineers recommend that you do some checking if you have any doubts about the safety of your plant, particularly if it is small. Insurance companies have safety engineers on their staffs that will be glad to help. Your local chapter or the National Safety Council itself will provide literature and technical assistance. The local fire marshal or fire department will be happy to respond to your request for inspection and can make safety recommendations.

It's important to bear in mind that accidents don't just happen—and neither does safety.

Auto, Truck Output

U. S. and Canada

	1953	1952
January	612,815	424,559
February	623,793	464,577
March	752,474	525,024
April	782,453,	570,464
May	685,390	542,559
June	713,206	542,479
July	757,595	226,134
August	641,242	322,755
September		595,715
October		656,767
November		548,782
December		569,715
Total		5,989,509

Week Ended	1953	1952
Aug. 8	137,671	43,964
Aug. 15	156,526	36,890
Aug. 22	163,635	109,588
Aug. 29	152,866	122,659
Sept. 5	138,211	111,095
Sept. 12	127,000*	137,295

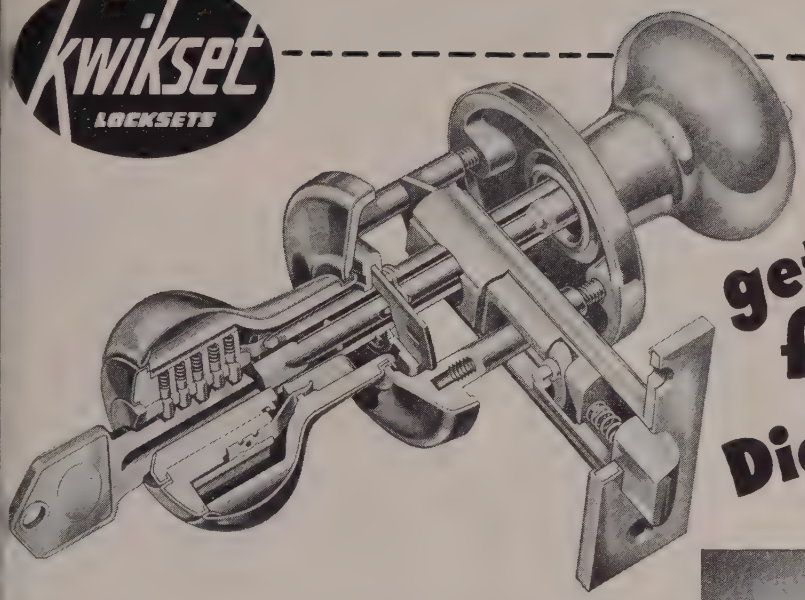
Sources: Ward's Automotive Reports.
*Estimated by STEEL

Industry Doings

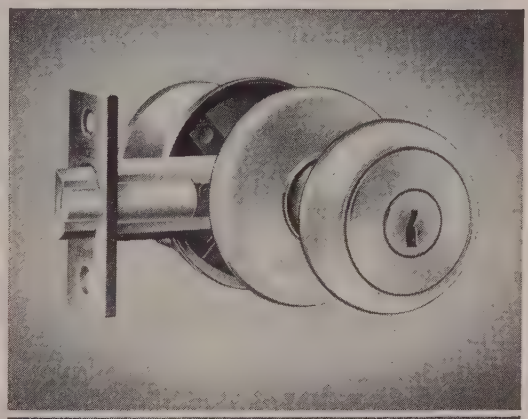
Ford Motor Co. announces it will build a 960,000-square-foot stamping plant in Walton Hills, O., southeast of Cleveland. About 2400 persons will be employed at the plant producing steel body parts and assemblies for Fords and Mercuries, with production expected to get under way late in 1954.

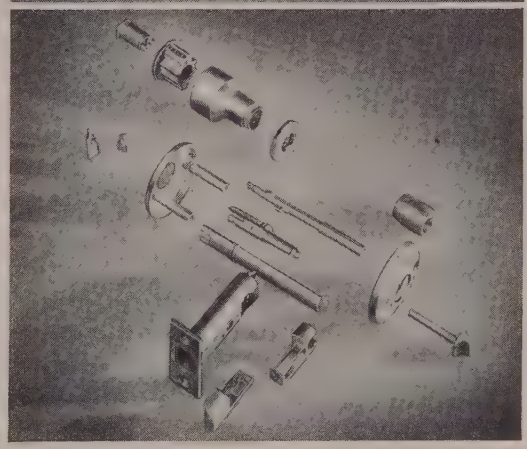
A new sports car hit the Detroit scene recently. It's the closed two passenger Hudson Italia packing a 114 hp Jet engine in a Jet chassis with an aluminum body by Touring of Milan, Italy. Step-down design, twin bucket seats, a luggage space behind the seats inside the car and doors carried 14 inches into the roof are noteworthy features. Curb weight is 2100 pounds and top speed over 110. It probably won't be manufactured.

Kwikset LOCKSETS



provide a key to- get the mo$t for your Zinc Die Ca$ting Dollar!





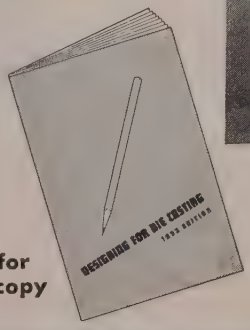
Attractive in design and beautifully finished in polished brass*, this lockset has also been engineered for precise, but rugged, construction at minimum cost. This combination of properties, achieved largely by the use of ZINC Die Cast components—16 in all—has resulted in the sale of millions of the locksets for private residences and large-scale housing developments throughout the U. S. and abroad.

The plain fact of the matter is that no metal and method of production other than ZINC Die Casting could turn out the lockset parts (lower right) with equal properties at comparable cost. Thanks to the complexity of shape possible with ZINC Die Castings, one part is made to serve in place of several—with impressive savings in both machining and assembling. Close tolerances, as cast, insure perfect fit of mating parts, and the inherent strength of ZINC provides the dependability so important in this type of product.

In selecting a die casting alloy there are many factors —both physical and mechanical—to be considered in addition to the base price of the metal. Ask any commercial die caster about the advantages of ZINC Die Castings—or write to us.

*Also available in polished chrome, or in satin brass, bronze or chrome.

The New Jersey Zinc Company
160 Front St., New York 38, N. Y.



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ZINC
FOR DIE CASTING ALLOYS

The Research was done, the Alloys were developed, and most Die Castings are based on

HORSE HEAD SPECIAL (99.99 + % Uniform Quality) ZINC

For the long haul... Autocar relies on RB&W bolts

Famous truck builder rates them best for ease of assembly and accessibility

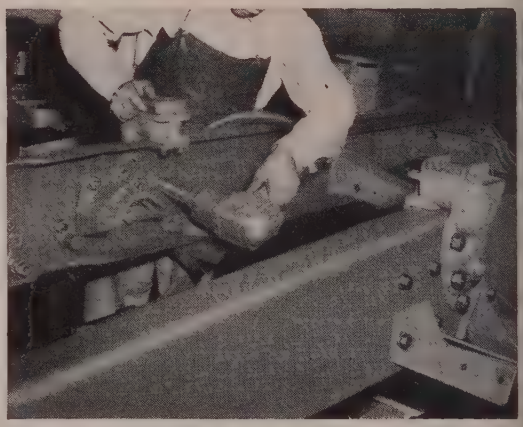
It's been a long time since the Autocar people switched from riveted to bolt-and-nut construction. Here's how it happened:

Two Autocar engineers took off on a coast-to-coast run to shake the bugs out of a new test model. Things went well until a riveted spring bracket broke. It took an entire day just to chisel through the rivets because it was hard to get at the bracket.

From that day on, it was *accessible* bolt-and-nut construction exclusively for all Autocar trucks. And Autocar standardized on RB&W bolts. One dividend from using these rugged bolts is that Autocar can specify higher-strength material than is practical for riveting. Furthermore, tests on structures like bridges show that rivets frequently loosen. This doesn't happen to bolts on Autocar frames.

Where you want to join structural members firmly together so they'll *stay* together for good, high-strength bolting is often your best bet.

As the leading manufacturer of all kinds of fasteners, we're in the unusual position of always being able to recommend and supply the right ones for all your needs. Write to RUSSELL, BURDSALL & WARD BOLT AND NUT COMPANY, Port Chester, N. Y.



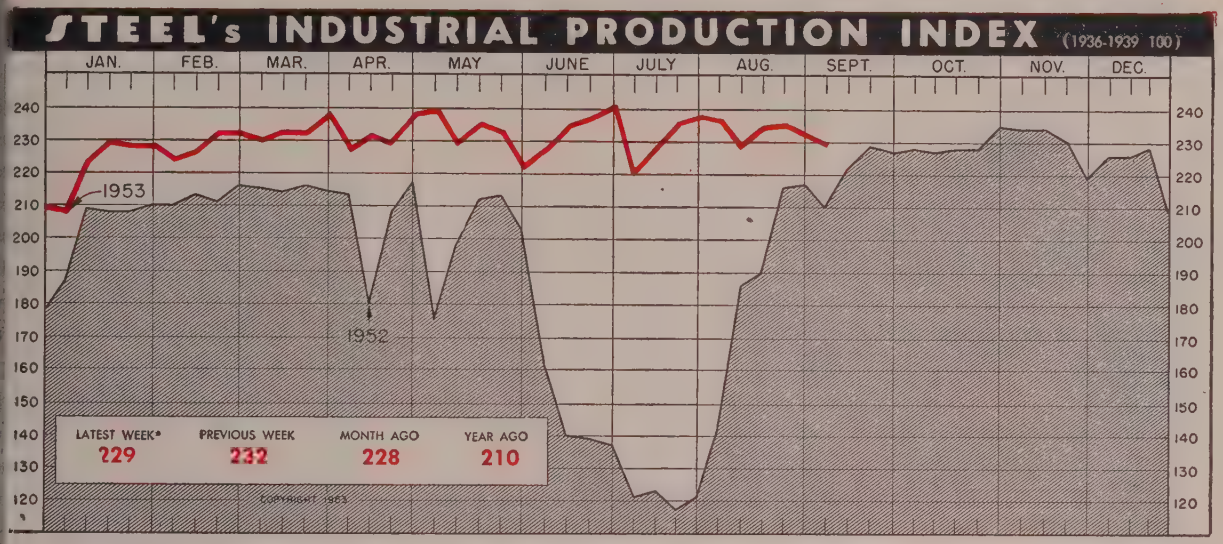
FASTER FASTENING is achieved in the Autocar plant at Ardmore, Pa., by using air tools like the one shown here to run up RB&W nuts on RB&W bolts on an Autocar truck frame. In addition to making tight, accessible joints, bolting effects substantial assembly savings.

3.1

RB&W

108 YEARS MAKING STRONG THE THINGS THAT MAKE AMERICA STRONG

Plants at: PORT CHESTER, N. Y., CORAOPOLIS, PA., ROCK FALLS, ILL., LOS ANGELES, CALIF. *Additional sales offices at:* PHILADELPHIA, PITTSBURGH, DETROIT, CHICAGO, DALLAS, SAN FRANCISCO. *Sales agents at:* PORTLAND, SEATTLE. *Distributors from coast to coast.*



*Week ended Sept. 5 Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 21%; Freight Car Loadings 22%; and Automotive Assemblies (Wards' Reports) 20%.

Curtailed GM automobile output is largely responsible for slight declines in industrial production. Nature's own heat wave wilts would-be purchasers also

AMERICA'S industrial cornucopia poured forth a slightly reduced volume during the week ended Sept. 5. As output dipped for the second consecutive week, STEEL's index of industrial production paused momentarily at 229 per cent of the 1936-1939 average. The pulse-beat of industry was off 12 points from the year's high and with the Labor Day holiday in the week just concluded, production slowed down a little more before the pace quickened.

Autos Slow Down . . .

Primary cause of this downturn was the decline in automobile output. During the week ended Sept. 5, outturn of cars and trucks in the U. S. and Canada fell to 138,211 units, according to *Ward's Automotive Reports*. U. S. output reached a 12-week low, largely due to the tragic GM fire. And that holocaust seems to have sent up in smoke all hopes that the motor vehicle industry had of surpassing the peak passenger car year of 1950.

Projections now indicate that output of pleasure-type cars in 1953 will be about 6.4-million units, second only to the 6,674,925 cars built three years ago. Perhaps it is well that auto production is scheduled to taper off. Otherwise, dealers might become overloaded with cars. In July, the second highest output month this year, registrations of new cars approximated only 533,000 units, says R. L. Polk & Co. This number is lower than registrations in May and June, when auto production was less than in July.

Order Backlog Dwindles . . .

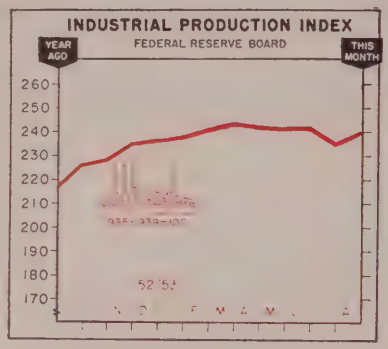
In line with the tempered demands of the public, the Purchasing Agents Association of Chicago, says that the backlog of orders for industry has reached the lowest point since May, 1952. This lack of reserve orders is putting pressure on sales, cost reduction programs and buying. As a corollary of the decline in the order backlog, the Federal Reserve Board points out that its index of industrial production for August is expected to be only 238 per cent of the 1935-1939 average. This is two percentage points under the June level. Largest factor in the decline will probably be the reduced manufacture of durable goods, as it was during July.

More Power . . .

Although the demand for durable goods is undergoing a slight adjustment, electricity, which keeps the wheels of industry and most of our modern conveniences going, continues to set new generation records. During the week ended Aug. 29, distribution totaled 8,539,557,000 kilowatt-hours of electric power, the Edison Electric Institute says. This was the third time during August that a new record was set. To meet the growing demand for electric energy, the electric utility industry continues to increase its capacity. Latest month for which figures are available is June. Capacity then was 85.064,570 kilowatts, 9.8 per cent above June, 1952.

Building a Skyscraper . . .

Construction expenditures also keep on rising. Spending for new construction in August totaled slightly over $3.3 billion, according to the Bureau of Labor Statistics. This was another record, and one which played a prominent part in the $22,642 million expenditures for new building during the first eight months of the year. Spending during this period was about

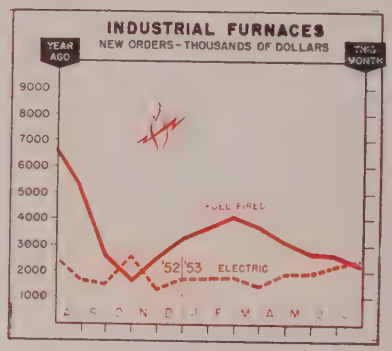


Industrial Production Index

1935-1939=100

	Total Production 1953	1952	Iron, Steel 1953	1952	Non-ferrous 1953	1952
Jan.	236	220	287	261	249	215
Feb.	240	222	290	261	259	217
Mar.	243	220	297	262	261	218
Apr.	241	216	292	245	264	218
May	240	211	291	245	263	220
June	240	203	288	142	258	212
July	233	193	279	141	252	201
Aug.	238	215	...	241	...	212
Sept.	...	225	...	267	...	221
Oct.	...	227	...	276	...	228
Nov.	...	234	...	283	...	240
Dec.	...	235	...	287	...	245
Avg.	...	218	...	243	...	220

Federal Reserve Board

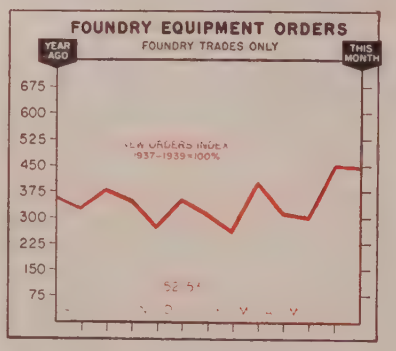


Industrial Furnaces

New Orders—Thousands of Dollars

	Fuel Fired* 1953	1952	Electric 1953	1952
Jan.	3,540	3,379	1,655	2,856
Feb.	3,996	2,413	1,672	1,363
Mar.	3,607	1,813	1,301	2,100
Apr.	3,017	3,606	1,796	2,298
May	2,609	3,032	1,799	3,713
June	2,550	2,954	2,095	1,552
July	2,017	6,728	2,246	2,530
Aug.	....	....	5,259	....	1,626
Sept.	....	....	2,462	....	1,412
Oct.	....	....	1,507	....	2,459
Nov.	....	....	2,382	....	1,241
Dec.	....	....	3,235	....	1,634

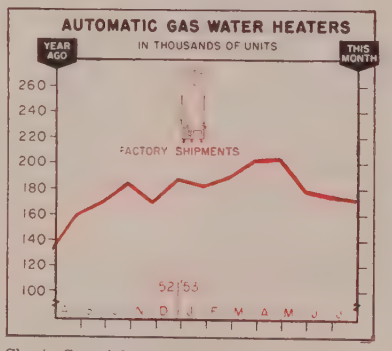
*Except for hot rolling steel.
Industrial Furnace Mfrs. Assn.



Foundry Equipment Orders

	Index (1935-1939=100) 1953	1952	Value, Thousands 1953	1952
Jan.	301.0	404.5	$1,379	$1,862
Feb.	257.3	200.4	1,179	922
Mar.	396.7	310.0	1,815	1,427
Apr.	303.0	385.1	1,305	1,773
May	294.4	225.2	1,563	1,037
June	446.8	353.8	2,998	1,629
July	440.8	243.9	2,362	1,583
Aug.	....	311.6	....	1,434
Sept.	....	365.9	....	1,685
Oct.	....	335.8	....	1,538
Nov.	....	258.1	....	1,183
Dec.	....	343.3	....	1,573

Foundry Equipment Mfrs. Assn.



Automatic Gas Water Heaters

Shipments in Units

	1953	1952	1951
Jan.	184,000	148,700	225,600
Feb.	188,500	145,800	213,400
Mar.	203,000	153,300	223,300
Apr.	204,400	153,300	199,400
May	179,000	155,300	167,400
June	175,000	159,000	131,500
July	173,000	131,300	102,400
Aug.	.....	161,500	124,400
Sept.	.....	171,200	130,900
Oct.	.....	185,300	148,800
Nov.	.....	167,100	143,400
Dec.	.....	178,600	127,200
Total	.....	1,910,400	1,937,700

Gas Appliance Mfrs. Assn.

Charts Copyright 1953 STEEL

Issue Dates on other FACTS and FIGURES Published by STEEL

Construction .....Aug. 10	Ironers .....Aug. 17	Ranges, Gas .....Sept. 7
Durable Goods ....Aug. 10	Machine Tools ....Aug. 3	Refrigerators .....Aug. 3
Employ., Metalwk..Aug. 10	Malleable Castings.Sept. 7	Steel Castings ....July 20
Employ., Steel ....Aug. 31	Prices, Consumer..Aug. 31	Steel Forgings ....July 20
Fab. Struc. Steel..Aug. 10	Prices, Wholesale..Aug. 24	Steel Shipments ...Sept. 7
Freight Cars .....Aug. 24	Pumps .....Aug. 24	Vacuum Cleaners..Aug. 3
Gear Sales .....Aug. 17	Radio, TV .....Aug. 31	Wages, Metalwk...Aug. 31
Gray Iron Castings.Sept. 7	Ranges, Elec. .....Aug. 3	Washers .....Aug. 17

$1.7 billion above the same period a year ago, and the largest factor in the 7.9 per cent increase was private construction.

TV Sets New Record . . .

The number of television sets produced during the first seven months of the year also set a record. TV output during this period totaled 4,150,525 units, says the Radio-Electronics-Television Manufacturers Association. With a sizable part of this production turned into sales, the National Broadcasting Co. estimated that there were 24,895,000 television receivers in U. S. homes on Aug. 1. Furthermore, the number of TV stations in the offing continues its sharp climb. On Aug. 21, the Federal Communications Commission issued another permit for construction and this brought the number of TV outlets approved since April, 1952, up to 423.

Factory Sales Up . . .

Even though TV production dropped appreciably from June through July, shipments by all manufacturers in the seventh month totaled $24.5 billion, 2 per cent above the June rate, according to the Office of Business Economics. In the durable goods category, record deliveries of primary metals and transportation equipment helped push sales up 3 per cent above the previous month. While factory sales were increasing, inventories on a seasonally adjusted basis rose only fractionally, with virtually all of the increase concentrated in the durable goods categories.

Wholesale Picture . . .

Like sales at the manufacturers' level, wholesalers' sales during July increased 2 per cent over the previous month. Although 13 of the 17 durable goods trades participated in this gain, sales in one of these trades, machinery equipment and supplies, dropped 13 per cent from June, for the third largest decline in any type of goods, hard or soft. With the general gain at the wholesale level in July, sales for the first seven months of the year were 7 per cent over the corresponding period in 1952, says the Bureau of the Census. Further-

BAROMETERS OF BUSINESS

	LATEST PERIOD	PRIOR WEEK	AGO YEAR
INDUSTRY			
Steel Ingot Output (per cent of capacity)[2]	95.5	94.5	100.0
Electric Power Distributed (million kwhr)	8,500[1]	8,540	7,324
Bitum. Coal Output (daily av.—1000 tons)	1,629	1,595	365
Petroleum Production (daily av.—1000 bbl)	6,615[1]	6,621	6,442
Construction Volume (ENR—millions)	$273.5	$214.3	$110.0
Automobile, Truck Output (Ward's—units)	138,211	152,866	111,095
TRADE			
Freight Car Loadings (unit—1000 cars)	810[1]	818	746
Business Failures (Dun & Bradstreet, no.)	150[1]	182	110
Currency in Circulation (millions)[3]	$30,240	$30,105	$29,391
Dept. Store Sales (changes from year ago)[3]	−9%	0%	−1%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$16,421	$15,733	$12,926
Federal Gross Debt (billions)	$273.3	$273.0	$262.9
Bond Volume, NYSE (millions)	$1.3	$10.6	$10.1
Stocks Sales, NYSE (thousands of shares)	6,554	6,210	4,337
Loans and Investments (billions)[4]	$79.3	$79.3	$75.5
U. S. Gov't. Obligations Held (billions)[4]	$32.0	$32.1	$32.2
PRICES			
STEEL's Finished Steel Price Index[5]	189.38	189.38	181.31
STEEL's Nonferrous Metal Price Index[6]	206.9	207.6	223.2
All Commodities[7]	110.3	110.7	111.8
Commodities Other Than Farm & Foods[7]	114.7	114.7	113.2

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1953, 2,254,459; 1952, 2,077,040. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

more, inventories were down about per cent from June. This reduction is a step in the right direction, for considerable sales activity is necessary to whittle down the 9 per cent inventory increase over July, 1952.

Department Store Sales . . .

Concerning sales activity, the recent heat wave that engulfed many sections of the country must bear prime responsibility for the per cent decline in department store sales in the week ended Aug. 29. However, even before the advent of the soaring temperatures, department store sales were languid. During July, purchases were down 19 per cent from June. Even though much of this decrease is due to seasonal factors, the fact that inventories dropped only 2 per cent during the same period reveals that sales did not come up to expectations. Also, outstanding orders at $523 million in July are about $3 million off from the same month last year.

More Employees . . .

Underlining the conditions in all industries besides providing an indication of future business is the number of employed and its corollary, the number of unemployed. Estimated at 63,408,000 by the Department of Commerce, the number of employed in August was at a record level. Moreover, with only 1,240,000 persons unemployed in August, the post-World War II low was equaled.

Income and Credit . . .

The August level of employment was nearly 400,000 more than in July. And in July, personal income rose $1.5 billion above June to achieve an annual rate of $288 billion, a figure 7 per cent more than the comparative period of 1952. Yet, this annual income was only part of what many people either wanted or needed. As a result consumer credit rose by $365 million over June to total $20,854 million in July.

Trends Fore and Aft . . .

During the first seven months of 1953, a total of 63,260 stock corporations were organized. This volume, 15.1 per cent over the corresponding 1952 period, was exceeded in the post-World War II period by only 1946 and 1945, Dun & Bradstreet says.

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HIGH QUALITY
REAMERS
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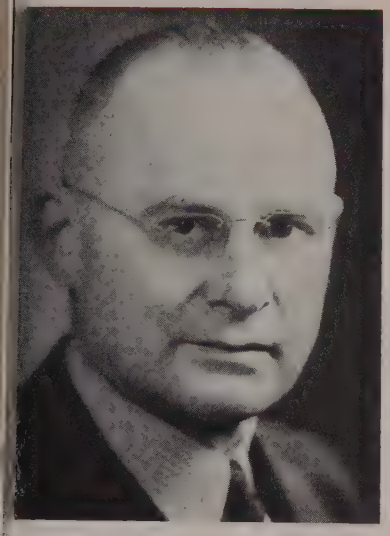
Men of Industry



J. L. WAGONER
joined Multi-Amp Corp.

V. V. BLASUTTA
. . . Denison Engineering v. p.

FLOYD J. COMPSON
. . . Buick's director of purchases

J. L. Wagoner, after 32 years with Westinghouse Electric Corp., joined **Multi-Amp Corp.,** Harrison, N. J., as vice president and national sales manager. He will have headquarters in Pittsburgh.

Don W. Blend, general manager, Wolverine Tube Division, **Calumet & Hecla Inc.,** Chicago, was elected a vice president of the company with headquarters in Detroit.

T. J. Ault was promoted to vice president and assistant general manager, Detroit Gear Division, **Borg-Warner Corp.,** Detroit. He has been vice president and purchasing agent for the Warner Gear Division, Muncie, Ind.

Robert E. Poethig, director of research and development at **Bastian-Blessing Co.,** Chicago, was made head of the newly consolidated department of research and production engineering. **E. V. Rupp,** in charge of production engineering for six years, has resigned.

James Pearson, former works manager, **National Steel Car Corp. Ltd.,** Hamilton, Ont., was appointed vice president in charge of operations.

Robert E. Sanford joined the staff of engineering consultants of **Clearing Machine Corp.,** Chicago.

Denison Engineering Co., Columbus, O., appointed **V. V. Blasutta** vice president and director of engineering. He was formerly chief engineer. In his new capacity he will direct activities of five divisions: Quality control, patents, research engineering, general engineering and product development.

Victor C. Armstrong was elected chairman, **Poor & Co.,** Chicago, to succeed the late **Fred A. Poor.** Mr. Armstrong retired two years ago as vice chairman and since has been a company consultant.

H. S. Pahren, W. E. Widau and **J. H. Strickler** were made commercial vice presidents of **Elliott Co.,** Jeannette, Pa. They are district office managers and maintain their present headquarters at, respectively, New York, Chicago and Pittsburgh.

Pacific Airmotive Corp., Burbank, Calif., elected **Roy Backman** to the new post of vice president-product sales.

Mark M. Templeton was appointed general superintendent of the new Marietta, O., plant of **Electro Metallurgical Co.**

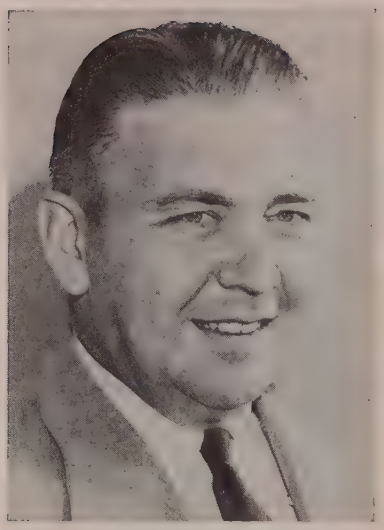
Elmes Engineering Division, American Steel Foundries, appointed **John E. Bush** district representative of the Chicago territory.

Floyd J. Compson, who joined **Buick Motor Division,** Flint, Mich., General Motors Corp., in 1932, as assistant purchasing agent, was made Buick's director of purchases. **Russell H. Eddy,** acting director of purchases since the death of William J. Brewer, has retired. **Conn L. Clifford** becomes assistant director of purchases.

M. E. Cunningham Co., Pittsburgh, elected **F. S. Speicher Jr.** president and treasurer; **F. S. Speicher Sr.** vice president in charge of research and development; **Walter J. Speicher** vice president in charge of sales and secretary; **William G. Kratz** vice president-production.

Republic Steel Corp., Cleveland, appointed **Joseph K. Bole Jr.** an assistant manager of sales in its bolt and nut division and **J. G. Wilsterman** in its wire division. **M. J. Cauger** was made assistant district sales manager, Chicago district, and placed in charge of the Milwaukee office. **Clydus F. Sells** was appointed superintendent, industrial relations, Warren, O., district steel plants.

Arnold J. Beyer was made division superintendent of power and fuel at the Gary, Ind., Works, **United States Steel Corp.** He is succeeded as assistant chief engineer, Gary Works, by **Raymond N. Ali,** form-



LAWRENCE H. FLORA

EDWARD E. GRIGER

WILLIAM L. SEITZ

. . . involved in organizational changes at Tinnerman Products Inc.

erly in a similar position at the Clairton Pa., Works.

Robert E. Dickson was made director of purchasing for **Ainsworth Mfg. Corp.**, Detroit. He joined Ainsworth after 16 years with Burroughs Corp.

Harbison-Walker Refractories Co., Pittsburgh, named **C. A. Brashares** and **Richard S. Moore** assistant general sales managers. **George M. Ullom** was made sales manager, Birmingham district, and **Joseph D. Custer** sales manager, Portsmouth, O., district.

Conoflow Corp., Philadelphia, promoted **Ralph G. Holben**, production manager, to plant manager. His duties will involve supervision of plant activities including production, purchasing and maintenance. **Horace C. Shuman** is now production manager. **Harold W. Bonekat** was named purchasing agent.

David Walters was appointed chief industrial engineer, **Bohn Aluminum & Brass Corp.**, Detroit.

Walter J. Prochak was named assistant superintendent, cold drawn bar department, at the Brier Hill Works of **Youngstown Sheet & Tube Co.**, Youngstown.

C. W. Windfelder, manager of the Milwaukee branch of **Carpenter Steel Co.**, was appointed assistant to the vice president of the company. He continues headquarters in Milwaukee. **F. P. McCahan** becomes manager there.

Tinnerman Products Inc., Cleveland, appointed **Lawrence H. Flora** to the newly created position of director of sales. He joined engineering staff in 1942 and served as head of the product development department until 1949 when he was appointed chief engineer. Since early this year he has served as director of engineering. **Edward E. Griger** was appointed sales manager, taking over duties of **William H. Taylor**, formerly general sales manager who resigned his post to become director of purchases for Packard Motor Car Co. **William L. Seitz**, formerly in charge of development engineering, was named chief engineer, and **John Balint**, formerly in charge of product engineering, was promoted to new product manager.

Elmer H. Wegner was appointed general manager of manufacturing for **Cleaver-Brooks Co.**, Milwaukee. He joined the company early this year as director of purchases and more recently was acting works manager.

Gisholt Machine Co. appointed **William E. Johnson** its junior representative in the Cleveland area to replace **Carl Welke**, who has been ill for the last several months.

G. E. Burks was made director of engineering, **Caterpillar Tractor Co.**, Peoria, Ill. He is succeeded by **John E. Jass** as chief engineer of the Peoria plant, and **Paul B. Benner** becomes assistant chief engineer. Mr. Burks will co-ordinate the program of all engineering groups serving the various plants and divisions of the company. **Dale S. Gronsdahl** was named a sales division district representative of the company with headquarters in San Leandro, Calif.

A. Neil Savee was promoted to sales manager, steel package division, **Geuder, Paeschke & Frey Co.**, Milwaukee. He succeeds **W. J. Flint**, resigned to join Continental Can Co.

James G. Goodwillie resigned as manager of safety grating sales for A. O. Smith Corp., Milwaukee, to become sales manager, clutch division, **June & Co.**, in eastern Wisconsin and northern Illinois and Indiana.

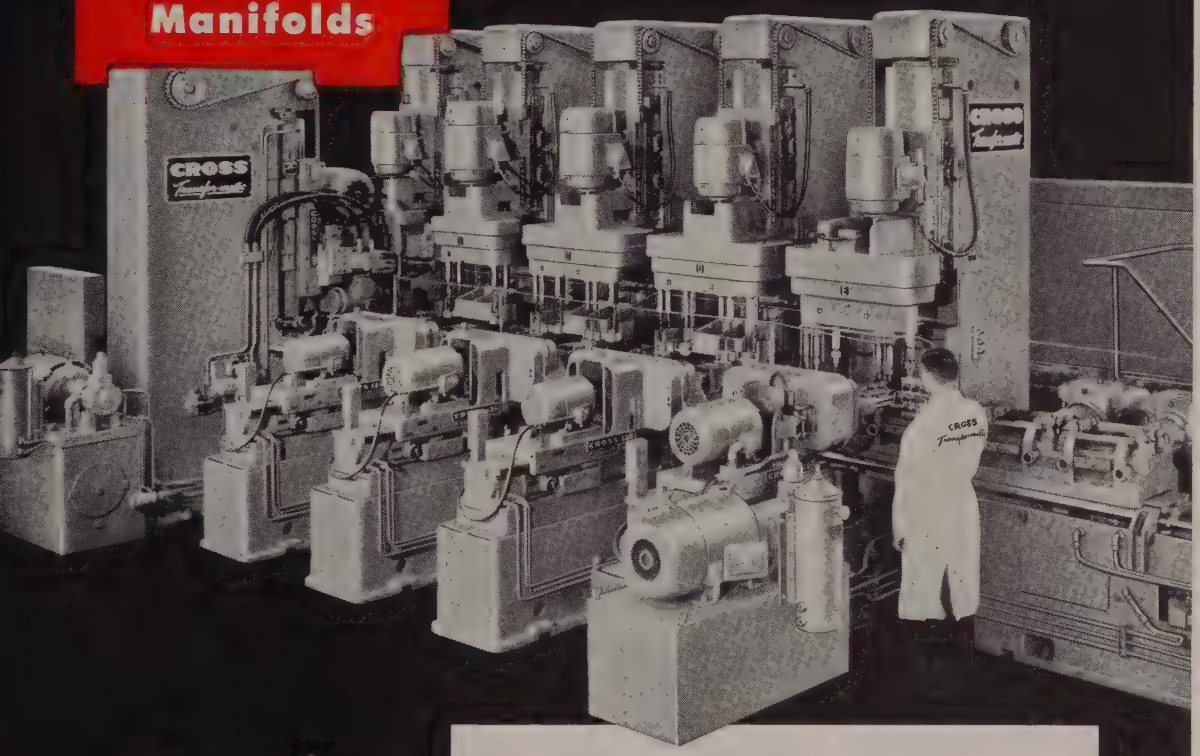
J. Doyle DeWitt was elected to the board of directors of **Niles-Bement-Pond Co.**, West Hartford, Conn. **Louis Reiss** was made treasurer, effective Oct. 1, succeeding **Richard W. Banfield** who has been treasurer as well as vice president. **Ernest J. Meuten** was made assistant treasurer and assistant controller.

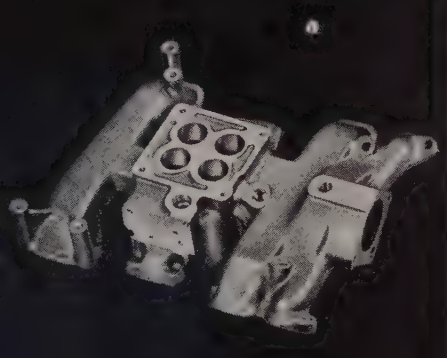
Dorward C. Witzke, former general manager of Continental Can Co.'s plastics division at Cambridge, O., joined **Cleveland Graphite Bronze Co.**, Cleveland, as assistant to the president.

Ronald N. Campbell was appointed

Drills, Bores, Mills, Intake Manifolds

Another Transfer-matic by Cross





★ 218 parts per hour at 100% efficiency.

★ Seven stations including loading and unloading.

★ 54 operations—22 drilling, 8 chamfering, 2 reaming, 12 tapping, 8 boring and 2 milling.

★ Two parts machined at one time in each station.

★ Palletized work holding fixtures and automatic transfer from station to station.

★ Power wrenches for automatically operating work holding fixtures.

★ Other features: Pre-set tools, built-in chip conveyor, automatic cleaning unit for removing chips from fixtures, J.I.C. Standard Construction.

Established 1898

THE CROSS CO.

DETROIT 7, MICHIGAN

Special MACHINE TOOLS

A. W. MORGAN
. . . appointment at Convair's San Diego div.

NIELDS B. HAAS
. . . mid-eastern sales mgr. for Carpenter

GEORGE WOOD
. . . Barrows Porcelain Enamel sales post

assistant to the president of **Affiliated Gas Equipment Inc.**, Cleveland.

A. W. Morgan, former works manager of Plant I, was named general manufacturing manager at the San Diego, Calif., division of **Consolidated Vultee Aircraft Corp.** He is replaced at Plant I by **W. L. Young.**

A. I. Davis, formerly manager of systems and procedures of Allegheny Ludlum Steel Corp., was appointed assistant to the president of **Federated Steel Corp.**, Pittsburgh.

Muskegon Piston Ring Co., Muskegon, Mich., elected **Harold G. Vaughan** president to succeed **T. E. McFall**, who continues as board chairman. Mr. Vaughan has been first vice president since 1936.

John P. Wright was appointed vice president in charge of manufacturing operations at **Florence Stove Co.**, Gardner, Mass.

Nields B. Haas becomes mid-eastern regional sales manager for **Carpenter Steel Co.'s** alloy tube division, Union, N. J.

William E. Boger was appointed general superintendent, **Alan Wood Steel Co.**, Conshohocken, Pa.

Ray Kensel is now district sales manager for Cleco Air Tool Division, **Reed Roller Bit Co.**, for Detroit, Cleveland, Cincinnati and Indianapolis area, replacing **B. O. Stoothoff**, resigned. Mr. Kensel has headquarters in Detroit.

National Research Corp., Cambridge, Mass., announces appointment of **James H. Moore** to general manager of its subsidiary, **Vacuum Metals Corp.**

Harry H. Armstrong was appointed to handle distributor sales for the building products division of **American Welding & Mfg. Co.**, Warren, O. He has been at St. Louis as zone manager for F. C. Russell Co.

George Wood was appointed director of industrial sales for **Barrows Porcelain Enamel Co.**, Cincinniti. Prior to joining Barrows he was assistant to the president of Enamel Products Co.

Donald C. Duvall assumes the newly created position of assistant works manager, Monessen, Pa., plant, **Pittsburgh Steel Co.** He is succeeded by **John Miller** as chief industrial engineer.

Bohn Aluminum & Brass Corp., Detroit, appointed **Guy Pitts** division manager of the brass and bronze division and the Michigan smelting and refining division. **Frank Turnbull** was made buyer of scrap material for the latter division.

Heil Process Equipment Corp. appointed **K. W. Grader** as Chicago district representative.

Robert G. Dobbin joined the commercial motor section at **Jack & Heintz Inc.**, Cleveland, as design engineer.

OBITUARIES . . .

Willard Van Horne, 51, vice president and general manager, **Viking Air Conditioning Co.** and president of **Modern Process Plating Co.**, Cleveland, died Sept. 1.

Littleton C. Barkley, 51, general sales manager, West Coast division, **Raybestos-Manhattan Inc.**, died Aug. 27 at San Mateo, Calif.

A. M. Giefer, vice president, **Standard Conveyor Co.**, St. Paul, died Aug. 22.

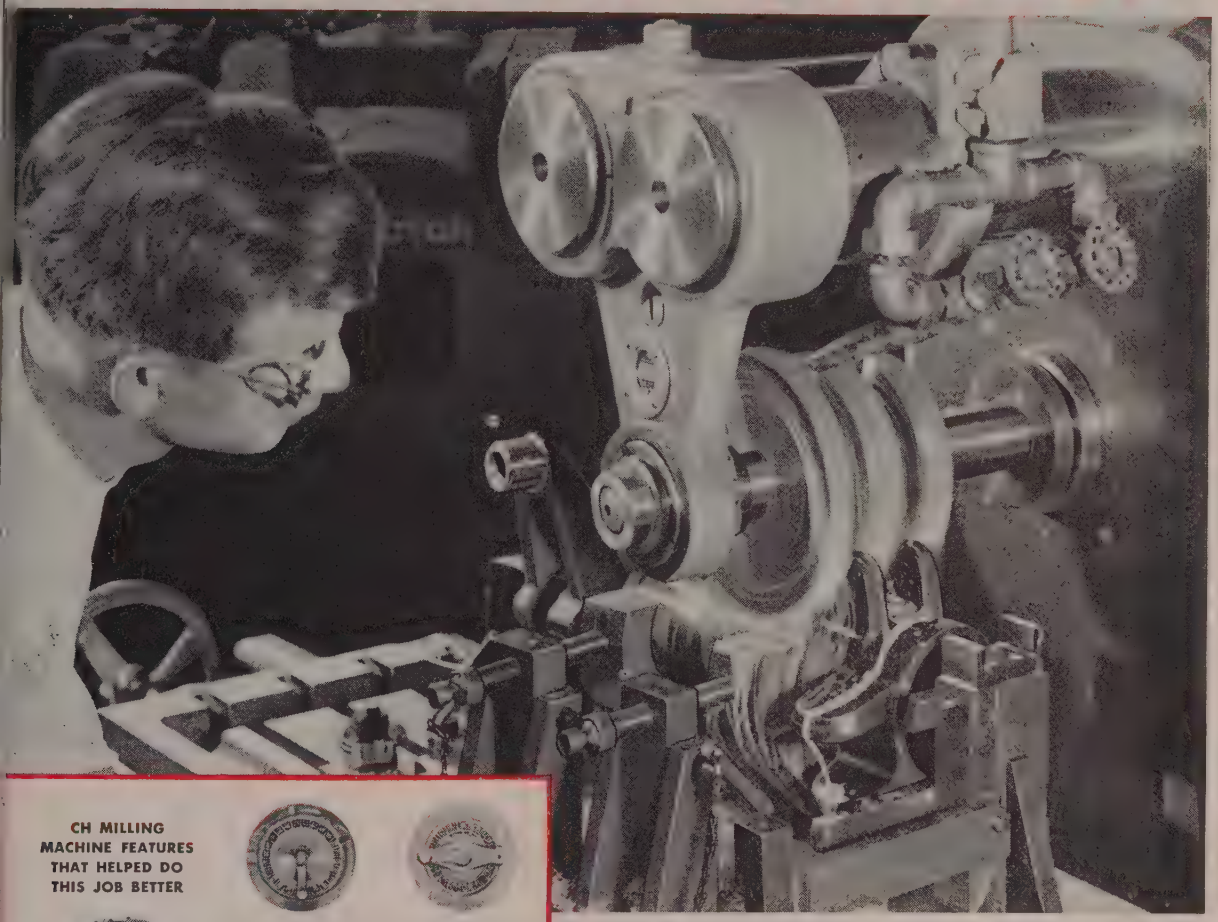
Albert C. Brown, 89, president, **Chicago Faucet Co.**, Chicago, for 43 years until retirement last March, died Aug. 29.

Prof. Kenneth H. Donaldson, 64, head of the department of metallurgical engineering at **Case Institute of Technology**, Cleveland, since 1937, died Sept. 3.

George H. Gaites, 59, district manager of **Bristol Co.**, Waterbury, Conn., and with the company for 33 years, died Sept. 1.

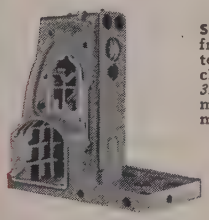
Dale R. Mason, 66, retired assistant to the vice president of **National Tube Division**, Gary, Ind., U. S. Steel Corp., died Aug. 27.

CH MILLING MACHINE COMBINES SPEED, ACCURACY AND POWER



CH MILLING MACHINE FEATURES THAT HELPED DO THIS JOB BETTER

Speeds and Feeds—*24* speed changes from *15* to *1500* rpm. Automatic protecto-mesh mechanism permits non-clash shifting during speed changes. *32* changes from ⅜" to *90"* per minute meet requirements of new metals and cutting tools.



Greater rigidity — Heavily ribbed, box section, sponson construction. Proper weight distribution absorbs vibration.

Greater cutting efficiency through a train of heavy duty, wide-faced, forged steel gears, hardened and specially processed.

Smoother feed performance through a heavy duty 2" dia. table feed screw. 23% greater bearing contact between screw nut for longer screw life and accuracy.

Greater horsepower — independent drives for spindle, feed and rapid traverse, and coolant. 15 hp to spindle . . . *3* hp for feed and rapid traverse... ¼ hp for coolant.

Here's a job handled on a new CH-4 Machine

Job: Menasco Mfg. Co., Burbank, Cal. Straddle Milling Drag Links
Machine: No. 4, Model CH, Plain Style
Part: Shock strut for landing gear cylinder
Cutter: High speed steel inserted tooth
Cutter Speed: 18 rpm, 15/32 ipm feed
Chip Load: .005"
Material: 4140 Steel forging, 43 Rockwell

Investigate the new CH line of milling machines. These and other features are job proven to give you cost-cutting results plus greater productivity, better finished products. Contact our nearest representative or write: Kearney & Trecker Corp., 6784 W. National Avenue, Milwaukee 14, Wisconsin.

KEARNEY & TRECKER MILWAUKEE MACHINE TOOLS

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OVERHEAD HANDLING SYSTEMS

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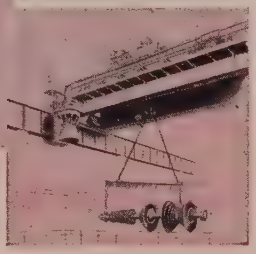
The Trackmobile

Electric Chain Hoists



Overhead Cranes

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• METAL-WORKING MACHINERY

More Tungsten Needed

Expansion of domestic mining aided by new law. Tungsten Institute is formed

EXPANSION of the tungsten mining industry of the United States and development of new domestic sources of supply will be stepped up under terms of Public Law 206, recently signed by President Eisenhower. His signature followed by only a few days his statement that in case Indo-China falls under Communist domination, tin and tungsten obtained from that area would be lost to the free world.

Institute Formed — Long-range planning designed to make this country self-sufficient in tungsten in the event of a national crisis is being stimulated by the newly formed Tungsten Institute with offices at 1757 K St., N.W., Washington.

At present the United States produces about 20 per cent of the free world's output of tungsten which is vitally necessary in the manufacture of high-speed cutting steels and in the production of jet engines for aircraft.

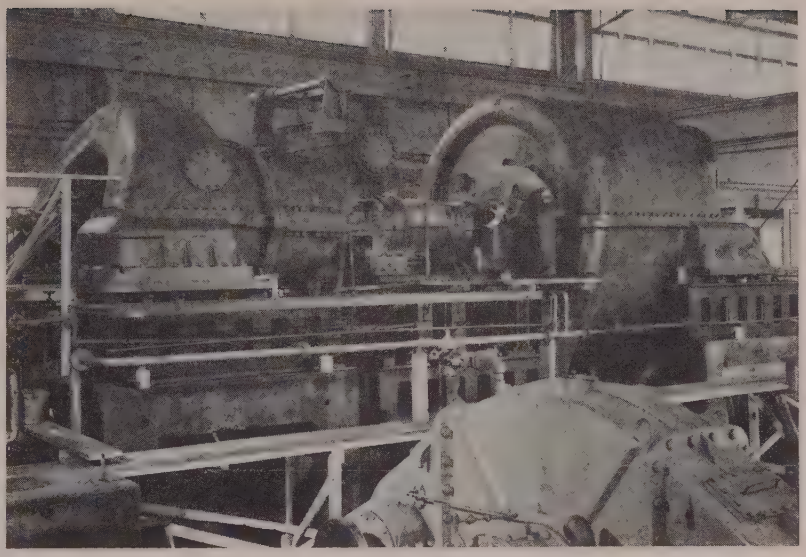
Principal domestic sources of tungsten now are found in California, Idaho, Nevada and North Carolina.

Need Is Urgent — W. Lunsford Long of Warrenton, N. C., president of the Tungsten Institute, says that Russia's recent claim to have the hydrogen bomb, along with what is reputed to be the world's largest submarine fleet, makes it urgent that domestic expansion of the strategic metal mining industry be pushed as rapidly as possible.

China was the world's largest supplier of tungsten prior to the seizure of that country by the Communists. But this supply now goes to Russia.

Principal sources of tungsten ore at present in the free world are the United States, South Korea, Portugal, Spain, Bolivia, Brazil, Burma, Canada, Australia and British Malaya. In event of war, it would be difficult to keep supply lines open to any of these countries except Canada.

Our government adopted a five-year price program in 1950. Under that program the government agreed to buy 3 million units of tungsten (20 lb of tungsten trioxide per unit) of domestic origin. To June 26, 1953, only 283,495 units had been delivered to the government. The new law extends the purchasing program to 1958 as a means of encouraging expansion of domestic tungsten mining.



Armco Operating Huge Turboblower

The turboblower shown above is one of the largest ever built in this country and was delivered early this year to Armco Steel Corp., Middletown, O. It is one of a pair built by De Laval Steam Turbine Co., Trenton, N. J., with a rated capacity to deliver 121,000 cubic feet of air per minute at 35 lb per square inch gage discharge pressure. It is driven by a 15,200-hp steam turbine

Lapointe Machine Tool Expands

Lapointe Machine Tool Co., Hudson, Mass., having completed a plant addition in July, is building a $100,000 structure for the heat-treatment of steel. The building will house several electronically-controlled heat-treating furnaces. For machine assembly, plant space has been doubled. Lapointe makes broaching machines and broaches.

Snell Forms New Department

Foster D. Snell Inc., New York, consulting chemist and engineer, formed an engineering physics department in the firm's Engineering Division. Walter L. Hardy is director of engineering, while Joseph P. McGill is in charge of the new department which will conduct investigative work on various problems in the physical sciences. One of its primary functions will be to study shock and vibration and their effect on packaged and unpackaged instruments and delicate equipment.

Torrington Building Addition

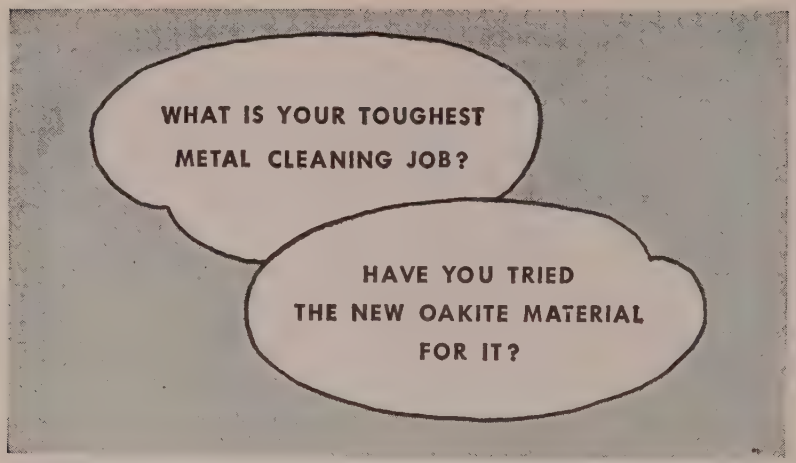
Torrington Mfg. Co., Torrington, Conn., started work on a $500,000 plant addition, the 15th major plant addition since the early 1900's. Among other products the company manufactures propeller fan blades and blower wheels.

Elkro Appoints Distributor

Elkro Co., Dayton, O., appointed as its representatives who will have exclusive sales rights on Velsey granite surface plates and Elkro heavy-duty industrial stands in their respective territories: Tool Supply & Engineering Co., Dallas; Willard H. Johnson, Rock Island, Ill.; A. M. Schmit Co., Toledo, O.; Charles W. Bringman, Orlando, Fla.; Morris Steel & Supply Co., Albuquerque, N. Mex.

Cherry-Burrell Buys Division

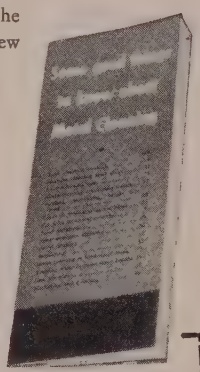
Cherry-Burrell Corp., Chicago, manufacturer of equipment and supplies for dairy, food and other processing industries, purchased the Bottle Washer Division, Heil Co., Milwaukee.



During the past year, the Oakite Chemical Research Laboratory has produced 16 new materials for performing the following metal cleaning and processing operations:

1 Heavy-duty cleaning in tanks
2 Etch-cleaning aluminum
3 Washing in pressure-spray machines
4 Electrocleaning zinc-base die castings
5 Putting heavy zinc phosphate coatings on steel in preparation for painting
6 One-operation cleaning, pickling and conditioning for painting
7 Stripping paint
8 "Killing" paint in spray booth wash water
9 Drawing and forming

One of these new materials may be the right answer for some problem that's been giving you a lot of trouble. Just circle the job number in the coupon, and let us tell you about the new chemical designed for the work.



FREE Our 44-page illustrated booklet "*Some good things to know about Metal Cleaning*" has been revised to discuss the application of the 16 new materials.

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MATERIALS • METHODS • SERVICE

Technical Service Representatives in Principal Cities of U. S. and Canada

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Send me a FREE copy of "*Some good things to know about Metal Cleaning.*" Also, give me more information about new Oakite materials for the jobs listed in your advertisement, as indicated by the numbers circled below:

1 2 3 4 5
6 7 8 9

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COMPANY_____

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Avondale To Build Plant

$500,000 will be invested for manufacture of porcelain enamel architectural products

AVONDALE MARINE WAYS Inc., New Orleans, is constructing a large-capacity plant adjacent to its main plant at Avondale, La. It will have facilities for the manufacture of porcelain enamel architectural products, including load bearing walls, loadspan roofdecks and other products which are new to the building industry.

The plant will be operated as a division of the firm. Its facilities will include automatic spray machines for applying the material, a large continuous furnace for fusing the enamel to the steel and ball mills in which the enamel will be prepared. The plant will have facilities for sheet metal fabrication and pickling of the steel prior to enameling.

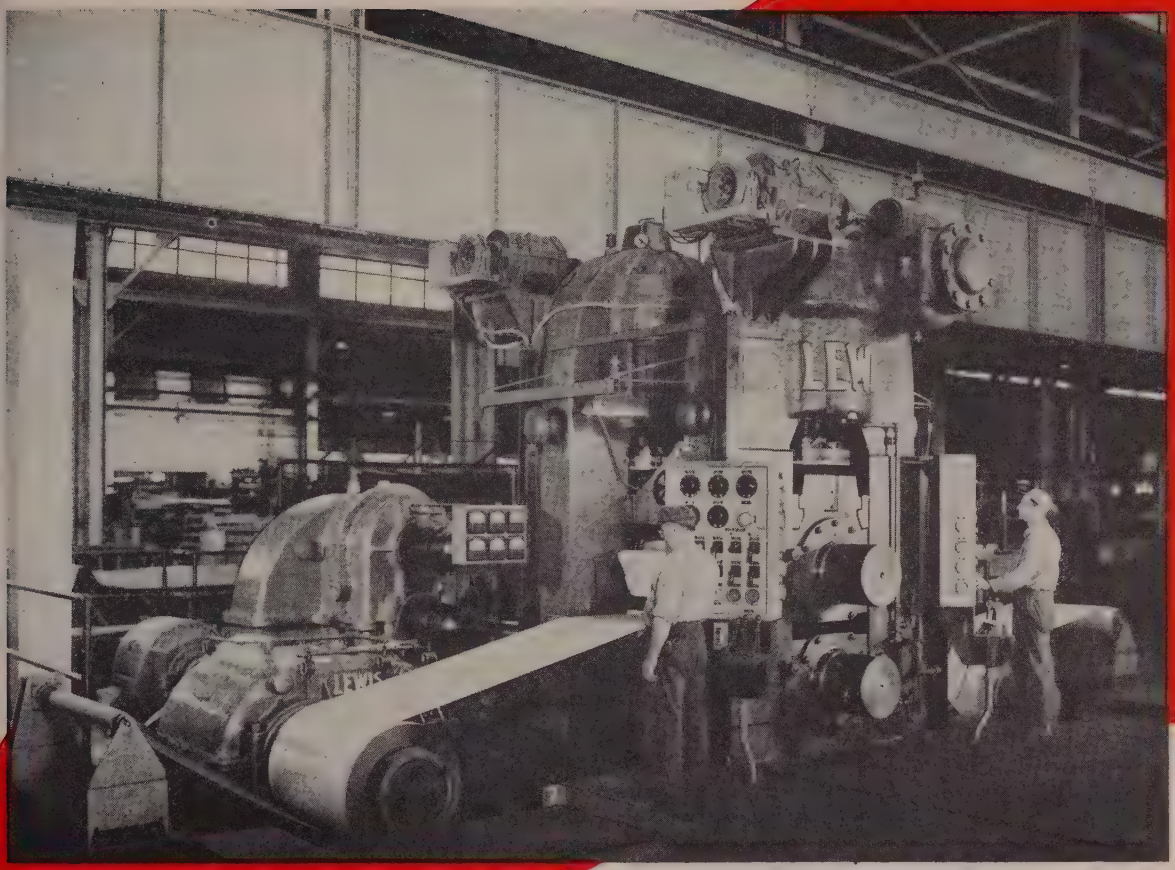
Big Outlay—Initial investment for this addition to the Avondale facilities will represent almost $500,000. It will be ready for operation in January or February.

Avondale's new division will be under the management of Ben F. Birdwell. Technical and production operations will be under the direction of Paul Kates.

"Avondale Marine Ways Inc. has been successfully specializing in steel fabrication for many years, and this new facility will reflect the high standard of integrity and efficiency which is traditional with Avondale," says J. H. Bull, president.

Establishes Six Scholarships

National Malleable & Steel Castings Co., Cleveland, is establishing $3000 in scholarship funds this year at six educational institutions as part of its program of observing its 85th year in business. The scholarships are for $500 each at Western Reserve University and Case Institute of Technology, Cleveland; Rose Polytechnic Institute, Terre Haute, Ind.; Carnegie Institute of Technology, Pittsburgh; Purdue University, Lafayette, Ind.; and Illinois Institute of Technology, Chicago. They are intended for students in the mechanical, metallurgical, industrial



Exit Side Showing Unwinder and Paper Reel

LEWIS 28" x 42" TWO-HIGH SKIN PASS MILL

Entry Side Showing Drive

High productive capacity and extreme accuracy of gauge make this ultra-modern mill a year 'round money-maker. Like all Lewis Rolling Mill Equipment, it was designed by men who are "mill conscious"—who know the problems of both owners and operators. We welcome the opportunity to go into details at your convenience.

BLAW-KNOX

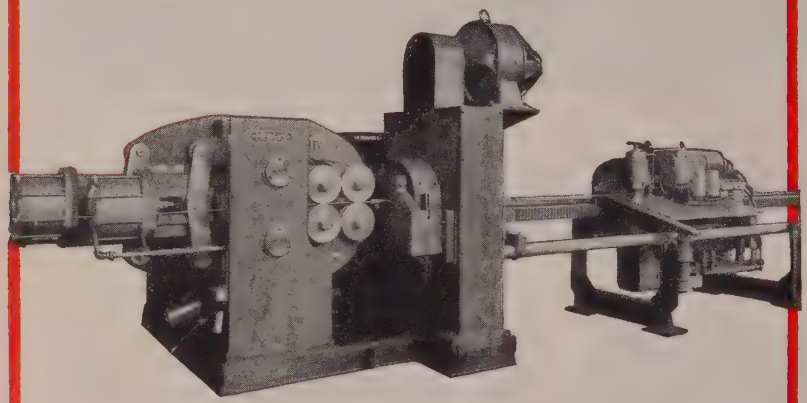
BLAW-KNOX COMPANY
LEWIS MACHINERY DIVISION
PITTSBURGH 22
PENNSYLVANIA

Triple Production or Better on Bar & Tube Turning!

MEDART

RFPD AUTOMATIC CENTERLESS BAR TURNERS

FOR BARS ¼" to 6" DIAMETER



- The unsurpassed production speeds of the RFPD Turner using carbide cutting tools—up to 12 ft. per minute—average from 3 to 4 times that of conventional turners by actual comparison.
- Material turned on this machine can be sold directly from the machine for "as turned" stock, put through the Medart two-roll rotary straightening, sizing and polishing machines for "turned and polished" stock, or given one pass through a centerless grinder for "ground" stock.
- The RFPD turning gives 100% material recovery with short, easy-to-handle chips.
- Direct-drive cutterhead, through single V-belt drive, is a single compact unit designed for either brazed tip or mechanically held carbide tools.
- Controls provide fully automatic push-button operation through entire cycle, and supplementary manual operation for setup. Both speeds and feeds are infinitely variable.

Many other cost-reducing, time-saving exclusives are offered in the RFPD Centerless Bar Turner.

Write For Illustrated Brochure

THE MEDART COMPANY 3535 De Kalb Street St. Louis 18, Mo.

and chemical engineering fields at the scientific schools and business administration at Western Reserve.

These are the first company-name scholarships to be arranged by the Foundry Educational Foundation, which is developing a nationwide educational program on behalf of the foundry industry.

Arcair Opens Branch in East

Arcair Co., Bremerton, Wash., manufacturer of electrodes and metal cutting and gouging torches, opened an eastern sales and distribution office at 423 S. Mt. Pleasant Ave., Lancaster, O.

Hercules Appoints Distributor

Cellulose products department, Hercules Powder Co., Wilmington, Del., appointed Central Solvents & Chemicals Co., Chicago, as distributor of its chlorinated paraffins.

Metromatic Mfg. Co. Expands

Metromatic Mfg. Co., Everett, Mass., is building a $250,000 plant in that city. The company assembles oil burners, and this expansion is the fourth since the company began building burners.

United Press

Ribbing a Giant

The wooden piece being fitted into place by this Westinghouse Electric worker forms one of the ribs in a nearly completed pattern for part of a turbine that will help power an atomic energy plant. When finished, the form will be encased in sand to produce a mold. The casting made from this mold will form a section of a 200,000-kilowatt steam turbine generator unit

Herrick Enters New Field

Organizes manufacturing firm to build equipment for automatic welding

C. B. HERRICK MFG. CORP., Cleveland, is building a line of standard equipment for automatic welding to be marketed by dealers througnout the country. The firm also will feature machinery specially designed and built for automatic welding applications.

"With the current trend in the welding industry, we are firmly convinced that automatic welding will make tremendous strides in the near future. Research and development has proven that automatic welding has not been fully explored, nor exploited by the fabricating companies," Clayton B. Herrick, president, says.

C. B. Herrick Mfg. Corp. was incorporated July 1 of this year to enter the manufacturing field. It is producing equipment now in leased space and plans to purchase its own plant soon.

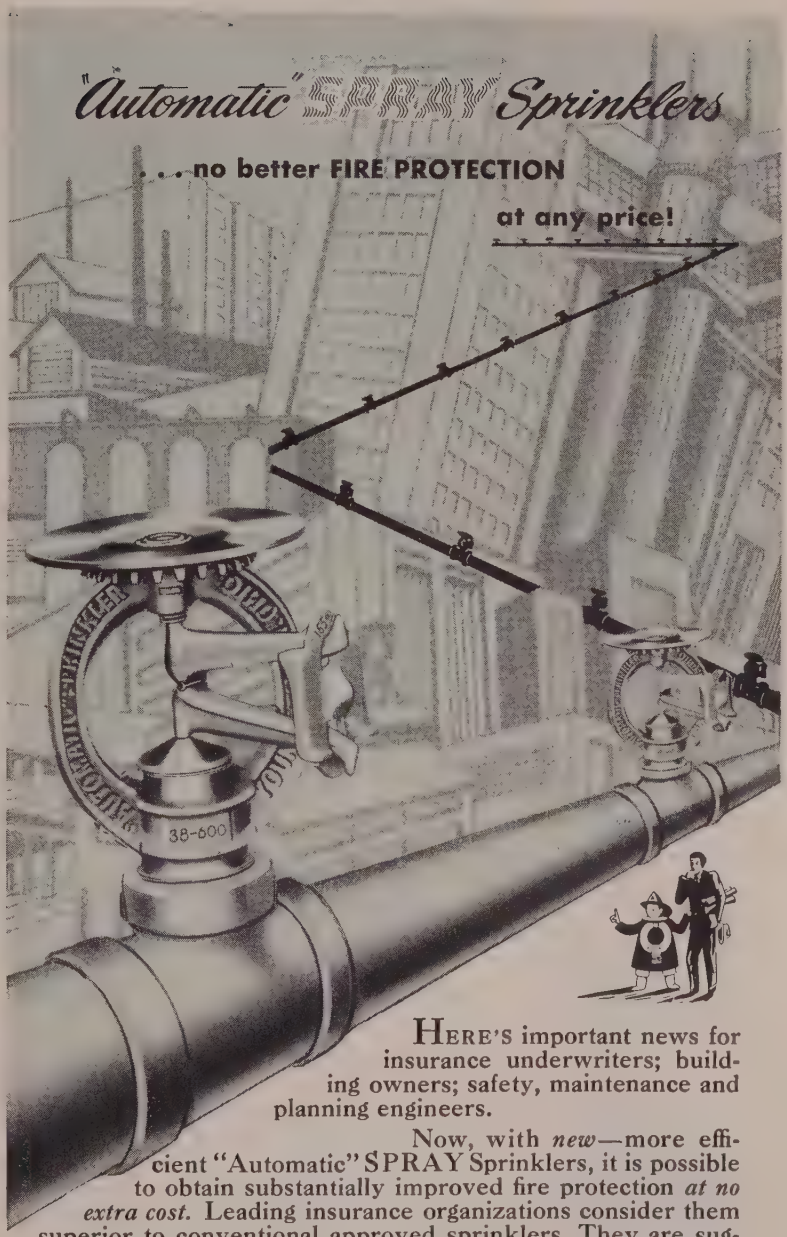
Mr. Herrick has been associated with Lincoln Electric Co., industry and welding publications and for the past several years has been identified with C. B. Herrick Co., manufacturers' agent. Willard G. Gunzelman, vice president of engineering and production, has had a wide background of engineering and design in both the electrical and mechanical field. Jack J. Jarms, vice president of sales, has been engaged in welding engineering for many years with the aircraft and shipbuilding industries.

Issues Screw Makers Directory

An up-to-date directory of manufacturers of wood, machine, cap and self-tapping (sheet metal) screws in the United States has been prepared by Machine, Wood & Cap Screw Service Bureaus, 53 Park Pl., New York 7.

Chromedge Ltd. Builds Plant

Chromedge Ltd., a newly-formed subsidiary of B & T Metals Co., Columbus, O., is erecting a plant in Toronto, Ont., with 27,500 sq ft of floor space. The firm will produce extruded aluminum molding and trim in the Canadian factory,



HERE'S important news for insurance underwriters; building owners; safety, maintenance and planning engineers.

Now, with *new*—more efficient "Automatic" SPRAY Sprinklers, it is possible to obtain substantially improved fire protection *at no extra cost.* Leading insurance organizations consider them superior to conventional approved sprinklers. They are suggested for use on all new construction, and can easily be interchanged with obsolete devices on old style systems without expensive piping rearrangement.

In short, absolute fire safety with "Automatic" SPRAY Sprinklers is worth far more than it costs. It's a long-lasting value that knows no measure.

Better get the facts on "Automatic" SPRAY Sprinklers, the most important advancement of the century in the science of fire protection. Fill out and mail the coupon below for illustrative literature.

"Automatic" Sprinkler

CORPORATION OF AMERICA
YOUNGSTOWN, OHIO
Offices in principal cities of North and South America

"AUTOMATIC" SPRINKLER CORPORATION OF AMERICA
DEPT. E, Youngstown 1, Ohio
SEND US BULLETIN 69, "AUTOMATIC" SPRAY SPRINKLERS.

NAME .....
TITLE .....
COMPANY .....
CITY ..... ZONE .....
STATE .....

Six MORE REASONS WHY

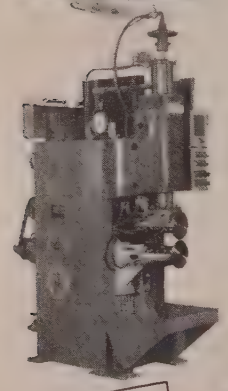
Federal

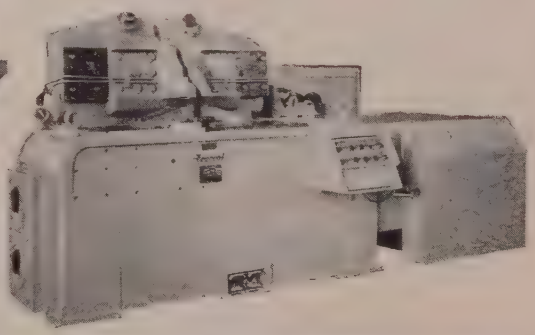
STAYS "FIRST IN RESISTANCE WELDING"

From standard spot welders to special machines FEDERAL has the resistance welder tailored to cut your production costs.

The most complete line in the industry also offers you the plus features of sturdy design, highest quality workmanship and attention to details; such as, maintenance accessibility, which make FEDERAL FIRST IN RESISTANCE WELDING.

Let us work with you on your resistance welding applications, so that you can benefit from our engineering and production background. Remember, our experience pays you dividends in lower equipment costs and faster solution of your welding problem.





Federal® WELDERS

Warco® PRESSES

THE FEDERAL MACHINE & WELDER COMPANY

WARREN, OHIO

of which Harry Staples has bee named manager.

Japanese Firm Licensed

Western Machinery Co., Sa Francisco, entered into a licensin agreement with Sumitomo Machi ery Co. of Tokyo and Osaka, Japa under which its line of ore-dressin and mining products may be ma ufactured and sold in that country

Hewson Appoints Representativ

John Hewson Co., New York, ap pointed Thomas A. Collier Co., Phi adelphia, as its representative fo its insulation test sets, high-volt age power supplies, control an alarm systems.

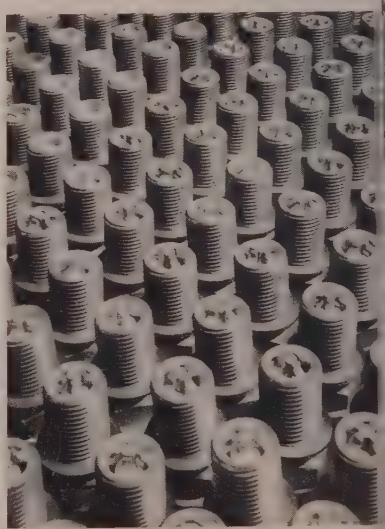
Air Preheater Building Plant

Air Preheater Corp., New York is erecting a $300,000 office build ing near Wellsville, N. Y. Herma Marshall, general manager, sai completion is set for January.

Horizons Inc. Leases Building

Horizons Inc., Princeton, N. J. leased a building at 2905 E. 79t St., Cleveland, which will accom modate expanded physics, metal lurgy and ceramics departments

(*Please turn to Page* 98)



Wide World

Plug Lovelies

Row upon row of aircraft spark plugs stand ready for inspection. They were cleaned by a process, developed by scientists at Battelle Memorial Institute, Columbus, O., employing a blast of caustic soda solution to remove lead compounds which cut firing efficiency

HOW WHEELABRATOR® STEEL SHOT Strikes at the HEART of Your Cleaning Cost Reduction Problem

LESS ABRASIVE CONSUMPTION

General Heat Treating Co., Syracuse, N. Y. is able to clean 217 lbs. of heat treat work for every pound of Wheelabrator Steel Shot consumed, compared to only 34 lb. of work cleaned per lb. of malleabilized grit formerly used.

INCREASED PARTS LIFE

At a progressive Eastern Steel Foundry the use of Wheelabrator Steel Shot resulted in a 150% increase in blade life with corresponding increase in the usable life of other machine parts.

LOWER CLEANING COSTS

A large New York grey iron foundry slashed abrasive costs from $2.49 per hour to $1.54— a 38% reduction . . . when they switched from chilled iron grit to Wheelabrator Steel Shot.

LESS MAINTENANCE LABOR

Due to the 300% increase in machine parts life resulting from the use of Wheelabrator Steel Shot, maintenance labor costs were slashed at a prominent Eastern Plant.

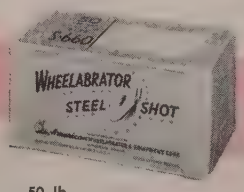
Another American FIRST

50 LB. CARTONS and PALLETIZING

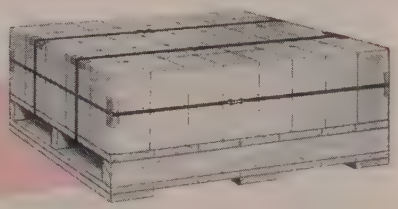
For Safety—Convenience—and Lower Cost to You

Wheelabrator steel shot is now packaged in strong, easy to handle 50 lb. cartons—more rugged and durable than antiquated burlap bags (100 lbs.). Shipments of 1 Ton or more are securely strapped to expendable pallets (40 cartons to a pallet) for safer transportation and easier handling and storage. *All at no extra cost!* Another "plus" for Wheelabrator Steel Shot—the modern blasting abrasive.

Easy-to-carry, easy-to-pour, this new carton reduces strain and fatigue in abrasive handling.



50 lb carton



A Palletized 1-Ton Shipment

WRITE FOR BULLETIN NO. 89

American

WHEELABRATOR & EQUIPMENT CORP.

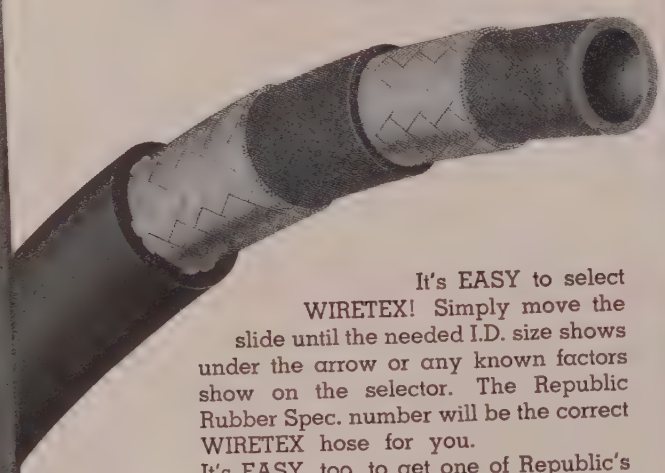
509 S. Byrkit St., Mishawaka, Indiana

Republic
WIRETEX

Rubber Covered
Hydraulic Hose
selector

SIZE I.D.
5/16"

REPUBLIC RUBBER SPEC.	WIRE BRAIDS	HOSE O.D.	MAX. W.P.	MIN. BURST	APPROX. WT./100'	BEND RADIUS
W-18-31	2	3/4"	4500	18,000	37	5"



It's EASY to select WIRETEX! Simply move the slide until the needed I.D. size shows under the arrow or any known factors show on the selector. The Republic Rubber Spec. number will be the correct WIRETEX hose for you.
It's EASY, too, to get one of Republic's new WIRETEX Selectors. This handy little slide fits right in your pocket (or desk drawer) and will unfailingly select the right Republic WIRETEX Spec. to fit any known factor.
SEND FOR YOURS TODAY! Write to:

"Quality Hose Builders for over 50 Years"

REPUBLIC RUBBER DIVISION
LEE RUBBER & TIRE CORPORATION, YOUNGSTOWN 1, OHIO
INDUSTRIAL RUBBER PRODUCTS

(Continued from Page 96)

Horizon's main building is at 289 E. 79th St., that city.

Forms Mill Machinery Firm

Mannesmann Works has combined with Maschinenfabrik Meer A. G., Germany, to form a new company in the United States Mannesmann-Meer Engineering & Construction Co. Founders of the Mannesmann firm invented the rotary piercing mill while the other German firm is one of the world's leading seamless tube mill machine manufacturers.

The newly formed company will offer a complete line of seamless tube mill machinery, as well as hydraulic equipment and other special mill machinery for the steel, copper, brass, aluminum and other branches of the metalworking industry. It offers also an engineering service for planning and operation of tube mill machinery.

Officers of the new company are: Dr. K. Gruber, chairman of the board; Dr. Gerhard Wagner, president; A. L. Thurman, executive vice president; John D. Judge, vice president; and K. Schwing, secretary-treasurer.

Executive and general offices of the company are located in the Woolworth building, New York. Sales and engineering headquarters are at 900 Line St., Easton, Pa.

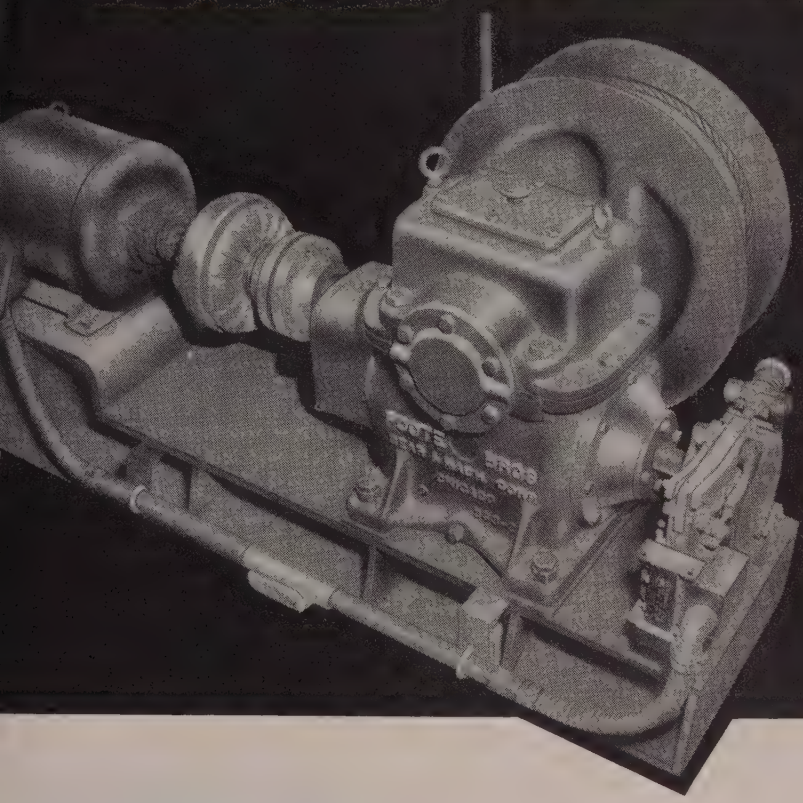
To Sell U.S. Steel Homes

Alan Brockbank of Salt Lake City, Utah, president of National Association of Home Builders, Washington, joined the organization of dealers for United States Steel Homes Inc., housing subsidiary of United States Steel Corp., Pittsburgh.

Bowser Inc. Forms Subsidiary

Bowser Inc., Chicago, formed a subsidiary company known as Process Filters Inc., Buffalo. The new firm will design and engineer industrial liquid control equipment for the chemical, petroleum, food and processing industries. Edward A. Ulrich is vice president and general manager of the Buffalo subsidiary, and Harold C. Lucht is treasurer and chief engineer. Both formerly were officials of the Niagara Filter Corp. which was sold early this year to American Ma-

TOUGH JOBS MADE EASY...



WITH FOOTE BROS. HYGRADE DRIVES... MORE STAMINA IN LESS SPACE

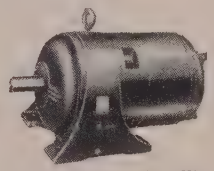
Horizontal Hygrade Drive operating door-control cable of open hearth furnace at Fairless Works, United States Steel Corporation. For purposes of illustration, safety guard over coupling has been removed.

Steel making is a rugged, 'round-the-clock job. And Foote Bros. Hygrade Drives have the stamina for such typical, tough service — like this Hygrade at U. S. Steel's Fairless Works.

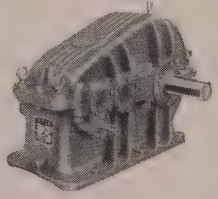
Sturdy, compact Hygrade Drives are built especially for heavy-duty applications — ratios range up to 4,108 to 1, capacities up to 260 h.p. But Enclosed Hygrade Drives are also designed to meet area limitations — modern, space-saving housings have been engineered around new-process, high-efficiency worm gearing to assure maximum performance in minimum space.

For optimum load-carrying capacity — for maintenance-free operation — for day-after-day service under the most rugged conditions... select Foote Bros. Hygrade Worm Gear Drives. There's a complete line — a size and type to meet all your requirements. Available with either horizontal or vertical output shaft. For special applications, Vertical Hytop Hygrade provides a long, extended, output shaft without additional support. For prompt delivery, call your Foote Bros. representative or write for bulletin.

Line-O-Power Drives



Foote Bros.-Louis Allis Gearmotors



Maxi-Power Drives

This Trademark Stands for the Finest in Industrial Gearing

FOOTE BROS.

Better Power Transmission Through Better Gears

FOOTE BROS. GEAR AND MACHINE CORPORATION
4545 South Western Boulevard • Chicago 9, Illinois

Foote Bros. Gear and Machine Corporation
Dept. X, 4545 South Western Blvd., Chicago 9, Illinois

Please send Bulletin HGB. I understand it contains full information on Hygrade Drives.

Name.....

Position.....

Company.....

Address.....

City.....Zone.....State.....

CONSISTENTLY good scoring, game after game, is the attribute which sets apart the championship team from the run-of-the-mine bowling quintette.

It's much the same in our game. When you select a contracting firm to undertake responsibility for your expansion program, you require an organization which consistently does quality work—quickly and economically.

The Commercial Contracting Corporation staff is proud of its qualifications and accomplishments—of the long list of clients it has served not once, but many times.

Just as any good bowling team welcomes a chance to compete, so this seasoned industrial team welcomes the opportunity to bid on any project involving one or more of the many CCC services.

CCC services, provided individually or under one PACKAGE contract, include:

• General Construction • Building Alterations • Demolition • Foundations • Press Erecting • Machinery Moving • Crane and Conveyor Installing • Equipment Warehousing • Steel Fabricating • Export Packaging •

COMMERCIAL CONTRACTING CORPORATION • General Contractors
12160 CLOVERDALE, DETROIT 4, MICHIGAN • TExas 4-Z400

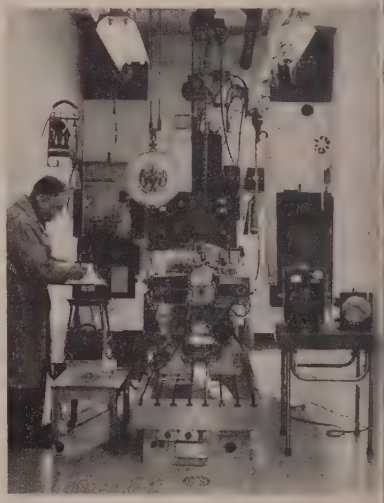
chine & Metals Co. Inc. and its business transferred to East Moline, Ill.

Builds Bar Mill Furnaces

Rust Furnace Co., Pittsburgh, completed a bar mill furnace and is constructing a second one at Colorado Fuel & Iron Corp.'s Minnequa Works, Pueblo, Colo. The furnaces are of the Rust zone-controlled continuous type, triple fired and nonrecuperative, with a capacity of 60 tons per hour. Both furnaces have inside widths of 20 ft with an effective heating length of 61 ft. They will be equipped for firing with natural or coke oven gas.

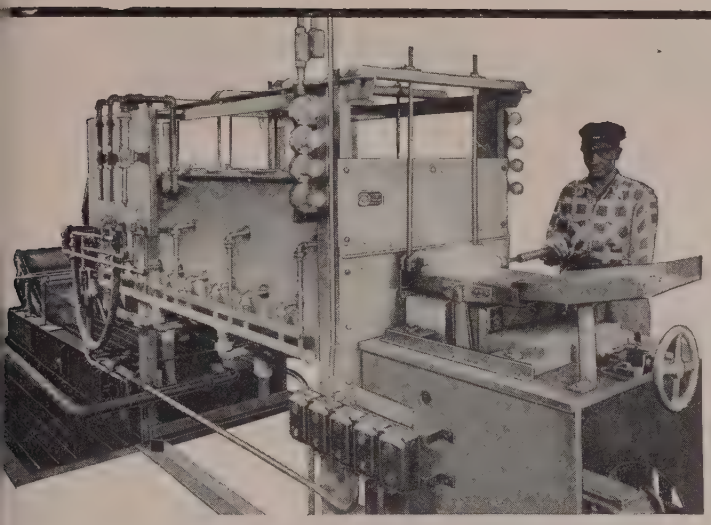
Hooker To Operate AEC Plant

Hooker Electrochemical Co., Niagara Falls, N. Y., will operate a large part of the Government's Lake Ontario Ordnance Works near Youngstown, N. Y., for the Atomic Energy Commission. This was disclosed by the AEC which said a $5-million alteration program will begin this month at the installation. The program will provide facilities for a classified production process.



Problem Solvers

Dynamometer operator Lee Beebe at the plant of D. W. Onan & Sons Inc., Milwaukee, has laid out a few of the busiest devices used to filter out the best designs, methods, materials and parts for the firm's products. These instruments help solve problems covering a wide range, from determining the weight of a microscopic piece of metal to the rpm at which a spinning fly-wheel will disintegrate



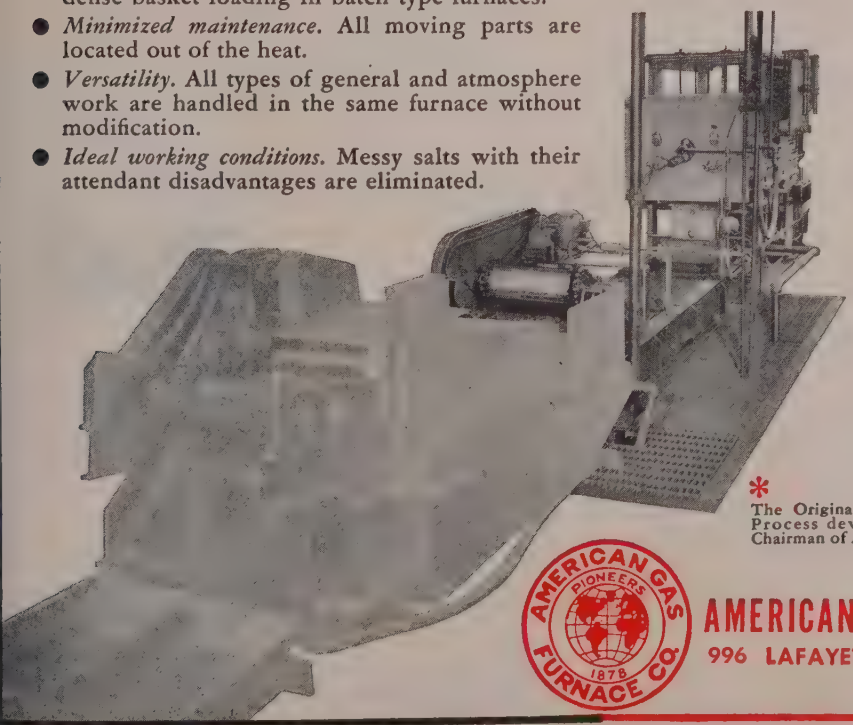
A.G.F. Model No. 166 Continuous Reciprocating Furnace and Automatic Quench Tank installation in the Chicago Screw Company plant at Bellwood, Illinois.

$10,000.00 saved annually by using AGF automatic continuous *"Ni-Carbing" EQUIPMENT IN Chicago Screw Co. plant Bellwood, Illinois

At the Chicago Screw Company, work such as screws, threaded fasteners, etc. is Ni-Carb* case hardened from a depth averaging .003" to .005" on relatively small pieces to a depth of .010" on large pieces up to 3/8" cross section. The use of an A.G.F. Reciprocating Furnace and the Ni-Carb* process saves Chicago Screw a net sum of $10,000 annually over other processing methods.

A.G.F. Reciprocating Furnaces with the full seal type muffle are completely modern production heat treating facilities with the attendant advantages of:

- *Low unit processing cost.*
- *Uniformity.* Each individual piece receives the same heat treatment and quench — not possible with dense basket loading in batch type furnaces.
- *Minimized maintenance.* All moving parts are located out of the heat.
- *Versatility.* All types of general and atmosphere work are handled in the same furnace without modification.
- *Ideal working conditions.* Messy salts with their attendant disadvantages are eliminated.

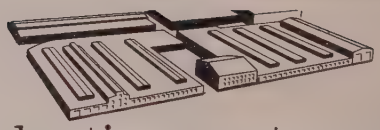


Discharge end view of the in-line continuous type installation of Reciprocating Furnace and Quench Tank at the Chicago Screw Company.

Write today for Bulletins 815 and 820 illustrating and describing the many features which enable A.G.F. Reciprocating Furnaces to lower your heat treating costs and improve the quality of your work.

* The Original Ammonia Gas Case Hardening Process developed by Mr. A. W. Machlet, Chairman of AGF.

AMERICAN GAS FURNACE CO.
996 LAFAYETTE ST., ELIZABETH 4, N. J.

Here's how AMF Cleve-Weld  can help you cut quantity-production costs of circular steel parts having cross-sections such as this. Ordinarily, you might start with a thick ring and machine away the excess metal. That way you'd pay for excess steel . . . then pay again for removing it!

But Cleve-Weld engineers who have specialized in rolled-and-welded steel parts for more than 40 years, would take a thin ring and shrink-fit onto it two concentric rings to form a blank *ready for finish-machining!* No waste metal to pay for . . . no rough-machining costs!

Get Cleve-Weld's price on your production quantities, then compute your savings!

CLEVE-WELD

THE CLEVELAND WELDING COMPANY

West 117th St. and Berea Road, Cleveland 7, Ohio

A Subsidiary of AMERICAN MACHINE & FOUNDRY COMPANY, New York

AMF products ARE BETTER...*by design*

Technical Outlook

ALLOY WITH MUSCLES—If you're looking for aluminum sheets for shelving or other applications that require strong brazed joints, J51S, product of Reynolds Metal Co., Louisville, may be the answer. Alloy is of the magnesium-silicide type. It's solution heat treated by temperatures which remove hardening effects of cold working on 2S or 3S, for example. Alloy also is less susceptible to blistering due to incipient eutectic melting, and artificial aging further adds to its strength.

SHELL MOLDING—Add magnesium to the list of metals that can be cast profitably in shell molds. Utica Radiator Corp., Utica, N. Y., reports definite savings since switching from green sand method. They use mixtures of Durez phenolic resin and sand with inhibitors to prevent burning.

SAFETY TUBE—Device to prevent explosions in atmospheric and open, fuel-fired furnaces has been developed by Ferguson Equipment Corp., Pittsburgh. Heart of unit is an electrically-heated tube that maintains above-ignition-point temperatures. In protective atmosphere furnace, tube is at bottom to burn infiltrating air before it can accumulate and mix with atmosphere. In latter, tube does same job at top of furnace, where gases tend to collect when chamber walls are below ignition point or only part of burners are firing.

TITANIUM FORGING—High strength alloy Ti-140-A is being die forged into 100-inch long propeller blade at Ladish Co., Cudahy, Wisc. Blade is being forged on one of the largest and most powerful closed-impression, die-forging hammers in the world.

HITS PAY DIRT—Technique of resistance, flash-butt welding copper and aluminum together on a production basis has been developed by Taylor-Winfield Corp., Warren, O. In job where 1 reject in 1000 was acceptable, process turned out 11,000 without a failure.

PRESSURE WELD—Process which may turn out to be a boon to tube makers is the Koldweld, developed jointly by General Electric Co. Ltd., Wembly, England, and Koldweld Corp., New York City. Already it's being used to seam weld boxes, seal tube ends and join flanged tubes to plates for hose connections. Since heat isn't used, special dies are the secret. They seal off work surfaces from atmosphere. True weld is made as die causes metal to flow sideways, continuously exposing fresh metal.

CLAY TOOLS—"Cutting tools with tips of sintered clay." That's the off-hand description of samples received at the Pentagon from England. Developed by Donald C. Oliver of the Ministry of Supply, tools are steel shanks with pink ceramic cutting tips. Not disclosed: Nature of ceramic and secret of attaching tip to shank. Naval Gun factory will try them out as straight and milling cutter tools. They're said to be especially useful in precision finish machining of aluminum and magnesium.

WHAT'S ON THE INSIDE—When you get right down to it, users of carbon steel bars have a man-sized job in selecting the proper grade and type to fit a given end use. First in a series of three "how-to" articles appears on p. 104 . . . "Improvement" programs in the plant and office generally are the result of perspiration rather than inspiration. You can profit by the experience of two companies in the use of plant movies on p. 158. On p. 173, possibility of substituting group numbers for calendar dates in production records is explored . . . It isn't often that old Mother Nature works for instead of against you. See how one company took advantage of a hillside location on p. 108.

Multiple-spindle, automatic-machine parts made from C-1212 and C-1213 grade steels

Guide for...

Selection of Carbon Steel Bars

Behind the volume production of carbon bars lies an equally impressive number of decisions confronting user in choosing the right grade and type to fit his needs

PART I

CARBON STEEL BARS are one of the most widely used products of the steel industry. This production, as viewed by the user, represents a staggering number of decisions involving selection of the right grade and type of bar for a multiplicity of end uses.

Requirements, of course, are governed by experience or individual specifications, but, in either instance, both management and the technical staff must consider many factors.

On the management level, there are four ultimates to weight: 1. Economy based on a satisfactory end product. 2. Sufficient factor of safety incorporated into the design. 3. Most economical method of production. 4. Lowest cost of raw material.

One of the first things to be decided upon by the technical group is whether alloy or carbon steel is required. Before this decision can be reached, such questions as hardenability, low-temperature impact resistance, high static strength and fatigue resistance must be answered.

Help Here—In picking a carbon bar, the user is confronted with a wide range of compositions and structures. He often solicits recommendations of the steel producers to aid in selecting the right grade and grain size.

There may be more than one side to the picture. For example, to improve machinability resulphurized steels are often used. However, they have certain limitations with respect to mechanical properties. So a normal sulphur steel is used with a comparative sacrifice in machinability. Here the consumer de-

By G. P. WITTEMAN
Assistant Metallurgical Engineer
Bethlehem Steel Co.
Bethlehem, Pa.

ermines from experience and engineering design whether a normal sulphur or resulphurized steel is best.

Types — There are two general types of carbon bars, nonkilled and killed. Companionate to these types are the austenitic or inherent grain sizes of coarse and fine, which are controlled by the steelmaking practice. Nonkilled steels are generally made coarse grain but cannot be so specified. Killed steels can be made coarse grain or fine grain.

When carbon steel is specified nonkilled, the steel producer decides from the end use and/or experience whether to apply rimmed, capped or semikilled steel. In general, these steels cover type analyses to carbon 0.28 maximum and manganese 0.60 maximum and are inherently coarse grain.

If carbon steel is specified killed, it is the option of the steel producer to apply coarse or fine grain, unless the consumer states which is desired. Selection of grain size may involve preferences, such as: Coarse grain for carburizing, machinability, heat treatment by oil quenching, fine grain for cold shaping, resistance to impact at normal and subzero temperatures, restricted surface requirements for such operations as hot upsetting and less distortion in heat treatment by liquid quenching.

Availability—When a specification or a requirement is established, next question is whether the grade, type and quality of carbon steel is readily available from mills or warehouses.

For simplification, it is always preferable to specify standard carbon steels. There are few cases where non-standard grades are actually required. American Iron and Steel Institute figures indicate that six combined standard grades of carbon steels comprise about 71.6 per cent of the steel industry's bar production.

This shows a marked contrast to the period prior to World War II when the steel industry produced over 5000 grades of carbon steel. During the war period, it was a matter of expediency; therefore, the number of grades had to be radically reduced which obviously increased production and improved availability.

Spread—Distribution of the six combined standard grades is as follows:

C1010	9.8%
C1020	34.0%
C1040	18.1%
C1117	3.8%
B1112, C1212	2.4%
B1113, C1213	3.5%
TOTAL	71.6%

Within these six combined grades are totals of 30 grades, 26 grades being 10xx steels and four grades 11xx steels. Evaluated on a variety of end uses there is justification for the six combined grades, which is further amplified if statistics are considered on the basis of the carbon spread for the 10xx steels and manganese spread for 11xx steels.

Grades — C1010 combines seven grades, C1008 through C1012, or a carbon spread of 0.07, including dead soft, soft and rivet steels. Grade range for C1010 is carbon 0.08 to 0.13 or 0.05, which accounts for 58.4 per cent of the combined grade tonnage.

(Continued on next page)

This is the first of three installments.

Article next week will be a definitive discussion of types of bar steels. Last installment will deal with engineering data involved in the selection of carbon steel bars which are summarized in extensive tables.

One of the industry's most widely used products, carbon steel bars, being hot rolled on modern, 10-inch mill. Bars also may be formed by cold rolling

Bars are cooled by water spray after coming off the finishing line. The physical properties imparted by careful processing will determine their end uses

C1020 combines 12 grades, C1015 through C1023, or a carbon spread of 0.12, including ASTM A-7, structural and mild steel. Grade range for C1020 is carbon 0.18 to 0.23 or 0.05, which accounts for 66.6 per cent of the combined tonnage.

C1040 combines eight grades, C1035 through C1046, or a carbon spread of 0.18. Grade range for C1040 is carbon 0.37 to 0.44 or 0.07. However, the greater tonnage prevails in C1045, carbon range 0.43 to 0.50 or 0.07. Accordingly, C1040 and C1045, with a carbon spread of 0.13, account for 55.3 per cent of the combined grade tonnage.

C1117 combines two grades, C1117 and C1118, with a manganese spread of 0.60. Grade range for C1117 is 0.30 manganese, which accounts for 85.7 per cent of the combined grade tonnage. So-called screw stock grades, B1112, B1113 and C1212, C1213, are combined with respect to steelmaking practice only—acid Bessemer and basic open hearth.

Definition—According to AISI, steel bars are considered carbon steel when no minimum content is specified or required for aluminum, boron, chromium, cobalt, columbium, molybdenum, nickel, titanium, tungsten, vanadium or zirconium, or any other element added to obtain a desired alloying effect.

Other conditions are: When specified minimum for copper does not exceed 0.40 per cent; or when the maximum content specified for any of the following elements does not exceed the percentages noted: manganese 1.65, silicon 0.60, copper 0.60.

In all carbon steels, small quantities of certain residual elements, unavoidably retained from raw materials, are sometimes found which are not specified or required. They include copper, nickel, molybdenum, chromium, etc. Because they are considered incidental, they are not normally determined or reported.

Standard Steels — These are based on AISI or SAE numbers which designate ladle chemical ranges and limits for basic open hearth and acid bessemer carbon steels. Two major classifications are identified by sulphur contents: 1. Normal sulphur, carbon steels, 0.05 per cent maximum for basic open hearth; 0.06 per cent maximum for acid bessemer; and 2. resulphurized basic open hearth and acid bessemer carbon steels, in the present sulphur ranges, from 0.06 per cent to 0.33 per cent.

Current grade number identifies the steelmaking processes, as well as chemical composition ranges and limits, which are outlined as follows:

AISI Steel Products Manual No. 2
Semi-finished Carbon Steel Products for Forging

	Grades
C10xx Basic Open Hearth Normal Sulphur	25
C11xx Basic Open Hearth Resulphurized	3

AISI Steel Products Manual No. 8
Hot Rolled Carbon Steel Bars

	Grades
C10xx Basic Open Hearth Normal Sulphur	51
B1010 Acid Bessemer Normal Sulphur	1
C11xx Basic Open Hearth resulphurized	21
B11xx Acid Bessemer Resulphurized	3
C12xx Basic Open Hearth Rephosphorized and Resulphurized	3

Effect of Constituents—Chemical compositions embrace the individual elements which collectively make up the carbon steel grade. For example, C1020: Carbon 0.18/0.23; manganese 0.30/0.60; phosphorus 0.040 maximum; and sulphur, 0.050 maximum. Silicon may be specified as 0.10 maximum, 0.10/0.20 or 0.15/0.30.

In a given grade of carbon steel, it is difficult to appraise the total effect of all its elements. Effect of a single one, on either the steelmaking practice or the resultant properties, is influenced by the effects of the other elements. These inter-relations, frequently of a complex nature, must be considered when evaluating a change in specified composition. However, to simplify this presentation, the various elements will be summarized separately.

Carbon—Amount of carbon in the finished steel restricts the type of steel that can be produced. In rimmed steel, an increasing carbon content impairs surface quality. Killed steels, by comparison, have poorer surface quality in lower carbon grades.

Carbon has a moderate tendency to segregate within the ingot, and because of its major effect on properties, carbon segregation is frequently of more significance than the segregation of other elements used in steelmaking.

Metallurgical Value — Carbon is the principal hardening element in all steel. Each increment of carbon up to 0.85 per cent increases hardness in the as-rolled or normalized condition. Above 0.85 per cent carbon, which is approximately a eutectoid composition, increase in hardness per increment of carbon is somewhat less. On the other hand, optimum hardness after quenching is attained with increasing carbon up to 0.60 per cent,

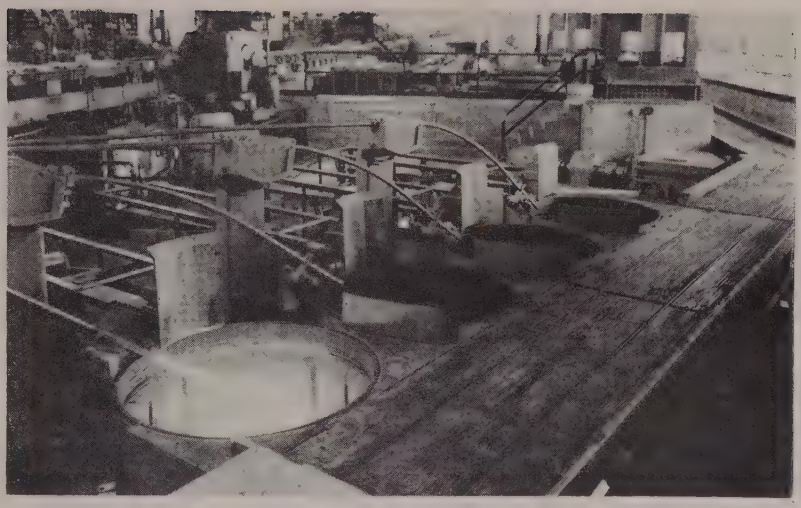
ter which the rate of increase minishes.

Likewise, tensile strength, in the -rolled or normalized condition, creases with the carbon content) to about 0.85 per cent carbon. or example, using an increment crease of 0.01 per cent carbon, nsile strength will be raised ap-roximately in proportion to the rbon levels as follows: 0.20 per nt carbon, 880 psi; 0.40 per cent rbon, 1040 psi; 0.60 per cent car-on, 1200 psi, etc.

When steels are supplied to andard mechanical property spe-fications, carbon content is at the tion of the steel producer. This rmits application of proper car-on content commensurate with ecified cross section and required echanical properties. Another int: Ductility and weldability de-ease with increasing carbon.

Manganese—Manganese is one the energetic deoxidizers and has ss tendency to segregate within ie ingot as compared with the her common elements. It is quite neficial to surface quality in all rbon ranges and minimizes "red ortness" or susceptibility to tear-g and cracking at rolling temper-tures. This is especially true with spect to resulphurized carbon eels.

Manganese contributes to hard-ess and strength but to a lesser egree than carbon. Gradation of crease in hardness and strength dependent upon the carbon con-nt. Higher carbon steels are more affected by manganese than are lower carbon steels. Higher manganese contents decrease ductility and weldability but to a lesser extent than would be exemplified with carbon. Manganese also increases the rate of carbon penetration in carburizing.



Hot carbon steel bars shown entering coilers at end of the finishing line. Intermediate steps have made the steel rimmed, capped, semi-killed or killed

Phosphorus—Phosphorus has a tendency to segregate within the ingot; however, this is not as pronounced as for carbon and sulphur. Due to the nature of the processes, phosphorus is not normally removed in acid open hearth or acid bessemer steels. This necessitates higher permissible specified limits.

Phosphorus increases the hardness and strength in approximately the same order as carbon. In some types of steel, there is a noticeable decrease in ductility and notched impact toughness. This is most significant in the higher carbon steels, which are quenched and tempered. Accordingly, phosphorus is normally not added to steel and is held as low as possible, consistent with the particular steelmaking process.

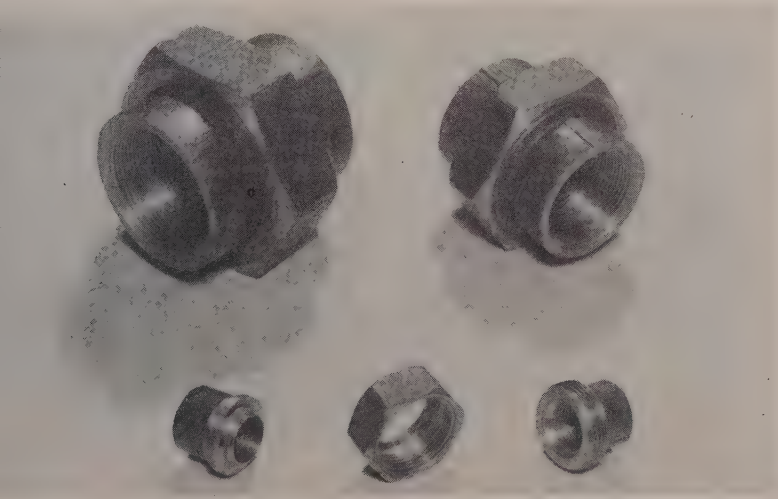
High phosphorus improves resistance to atmospheric corrosion, but it should never be applied to parts which are galvanized. In low carbon steels, it improves machinability by reason of higher ferrite hardness which produces better chip control and finishes.

Sulphur—Of all the common elements, sulphur has a greater tendency to segregate within the ingot. It is most detrimental to surface quality, particularly in low carbon and low manganese steels. As resulphurized steels have unstable properties during hot rolling, this condition is improved by maintaining an approximate 6 to 1 manganese to sulphur ratio.

Sulphur decreases transverse ductility and notched impact toughness and has only a slight effect on static longitudinal properties or hardness.

Helps Here — Machinability is considerably improved by the addition of sulphur to steel. This is co-existent because resulphurized steels always have a higher man-

(Continued on p 113)



ars are formed into many shapes. In this instance, carbon bars are used r forged-steel pipe unions. Applications depend on the grade and type

Bins extend through stock house (left) to furnace aisle, providing level materials movement to furnace floor. New substation is behind meltshop

Gravity Helps Double Stainless Output

By taking advantage of hillside site, Allegheny-Ludlum gets easy flow of materials at Watervliet electric meltshop. It was designed for large variety of quality steels

RECENT completion of a new three-furnace electric melt shop at the Watervliet plant of Allegheny Ludlum Steel Corp. doubles the rated capacity of this mill, the company's stainless steel bar and tube production headquarters. Rated capacity is now 72,000 tons per year.

Consisting of two 25-ton and one 12-ton capacity unit, the new furnace shop replaces older units and will feed the 22-inch blooming mill that was installed in 1949. Both melt shop and bloomer were designed for production of a large variety of quality steels.

Gravity To Work—Melt shop is built into a hillside, and the natural elevation is used to facilitate the flow of materials inside the shop. Main shop building is made up of a furnace and pit section measuring 106 x 300 feet, equally divided into the furnace aisle and the pit, and a 74 x 375-foot stackhouse.

Additional construction that was a part of the project includes a new 115/13.8 kv electrical substation and an addition to the existing substation. Also included is a railroad track system with storage and dump sidings, and an office and locker room building that will later house a direct-reading spectrometer for use in melting control.

Change Shells — All three furnaces are American Bridge Heroult types, the two larger ones being 10,000 kva units and the smaller one a 7500 kva model. The smaller furnace is equipped with two interchangeable shells to meet the special demands required for A-L's production. Ample space is provided for crane handling of the shells, and a change can be made in about an hour.

All the furnaces themselves are arranged for a maximum of 15 degrees back tilt to facilitate slag-off. Furnace aisle has a 17½-foot elevation, and is equipped with a 40/10-ton Cleveland crane, and two more of the same type service the pit which is equipped with 141 ingot mold stations.

Step-stools are provided to permit the pouring of ingots of varying height. Most of the pouring in this plant is in the form of 9 x 9-inch big-end-up ingots. Ceramic hot tops, utilizing exothermic liquidizers, are used.

Blooming Mill—Other half of the production team at Watervliet is the 22-inch blooming mill built by Birdsboro Foundry Machine Co. Mill consists of a two-high revers-

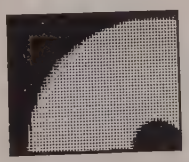
With electrodes rolled to one side, bottom drop bucket charges scrap into one of the 25-ton American Bridge Heroult 10,000 kva #15 R furnaces

NEW! BAY STATE BZ SAF-T-CUT

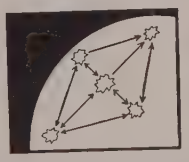
... A TRULY GREAT REINFORCED CUT-OFF WHEEL

- GREATER SAFETY
- GREATER COOLNESS
- GREATER LIFE (10 TO 20%)
- GREATER STRENGTH (100%)
- GREATER CUTTING SPEED (UP 20%)
- GREATER RESISTANCE TO LOADING

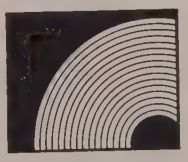
ACTUAL TESTS PROVE THAT BZ SAF-T-CUT WHEELS ARE... STRONGER... FASTER... COOLER



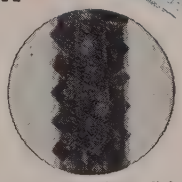
Reinforced with tough glass fiber for rugged STRENGTH and LONG LIFE.



New "BZ" Bond holds abrasive particles exactly right for OPTIMUM CUTTING POWER.



New Spiral Grooved sides give COOLER, CLEANER CUTTING on the 14" to 20" dia. sizes.



Micro photo shows "air-cooling" groove design that adds NON-BURNING feature.

Development of the new "BZ" bond was aimed at improving safety, cutting rate, and wheel life for all cut-off work on steel bars, pipe, angle iron and other structural shapes, as well as ferrous and non-ferrous castings.

Actual tests show fast, clean cuts on these materials, plus performance records of 10 to 20% better life . . . and up to 20% faster cutting rate than the best competition.

BAY STATE says to its sales force and to you, "We believe this 'BZ' SAF-T-CUT wheel to be the best reinforced resinoid cut-off wheel on the market today, from every point of view". Ask for a demonstration.

BAY STATE

lable in Aluminum Oxide abrasive (for ng metals), and Silicon Carbide abrasive cutting non-metallic materials).
in your BAY STATE REPRESENTATIVE for ils, or write for size and specification data.

BAY STATE ABRASIVE PRODUCTS CO., Westboro, Mass.

Branch Offices and Warehouses: Chicago, Cleveland, Detroit, Pittsburgh
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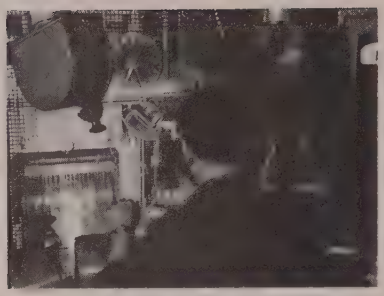


Controls for the 22-inch blooming mill are conveniently arranged in pulpit for operation by one man. Contact with operators of the auxiliary units is maintained by telephone

ing mill with manipulators, entry and delivery tables and an 18-inch stand also two-high but not reversible, a bloom or billet shear capable of cutting sections up to 36 inches square, seven heating furnaces of the batch type with a capacity of approximately 25 tons each, and two charging machines.

Production on this mill ranges from 2½-inch-square billets up. A typical pass design consists of a bullhead 16½ inches wide, edging passes of 9, 5¾, 4½ and 3½ inches in width. There are oval and square grooves for making 2¼ and 3-inch squares, or rounds from 2½ to 4¾ inches which are finished on the 18-inch stand.

One-Man Control — Feature of this unit is the operation of the 22-inch mill by one operator in the pulpit. Controls have been so arranged to permit easy manipulation of the mill. Approach and runout controls are ceiling-mounted; roll speed and direction is controlled by foot switch; and, screw down, side guards, mill tables and manipulators are controlled by switches arranged in a semicircle on the desk.

Screw-down dial has increments permitting the rolling of bars or billets to within 0.008 inch. Operator has full communication by two-way telephone with the shear operator, mill recorder and operator of the 18-inch stand.

Both stands have water cooled lubricated composition bearings of the segmental block design. The 22-inch mill uses the same material on the mill spindle slippers. Cast alloy steel rolls are hardened to withstand wear, but not hard enough to break with separating forces.

It's Cheaper to Salvage Cylinders

Wire inserts perform an inexpensive service in putting engine heads back into service after thread damage. They also resist high-temperature corrosion, seizing

EXPENSIVE castings that would ordinarily be scrapped because of seized threads are now salvaged with wire thread inserts in the dealer repair shops of Caterpillar Tractor Co., Peoria, Ill.

When seized screw-in type precombustion chambers are removed from tractor engine cylinder heads, threads in the head casting are usually damaged. Before use of wire thread inserts, these castings, usable in every other respect, had to be thrown away. Now, when threads are damaged, they are quickly and easily repaired—permitting these castings to be put back into service.

Procedure—Installation of these stainless steel wire thread inserts, manufactured by Heli-Coil Corp., Danbury, Conn., is accomplished in the following manner: After precombustion chamber is removed from block, the gasket taken off and the seal cleaned, a drill guide is inserted into the precombustion chamber opening of the head to position the drill. Before the damaged threads are drilled out, the operator makes sure that bottom of drill guide is seated properly in gasket counterbore.

Next, tap guide is placed over the shank of tap and the guide positioned in the cylinder. In this operation, new female threads, to receive the external threads of the insert, are cut into the hole. After the tap and tapping guide are removed, the hole is again cleared of chips.

Installation—The hole is now ready for installation of insert. Proper size prewinder is selected and placed into the counterbored section of sleeve assembly. Care is taken to insure that the hole in the prewinder is aligned with the pin on the leaf spring and that its smaller diameter is outside of the body. Nib to accommodate the particular size of thread insert being installed is selected and attached to a ½-inch square socket wrench extension.

Thread insert D is then placed on the nib so its inserting tang engages the slot in the nib and faces mouth of the slot.

Next, nib and insert slide into body until the insert rests against the prewinder. After this, drive wrench is rotated clockwise with a slight forward pressure until the insert is wound into the prewinder three or four turns.

Positioning—After this, the prewinder assembly is pressed downward firmly against the work and the insert turned into the hole until turning resistance disappears. This denotes that insert is positioned properly ¼ to ½ turn below the surface of the casting.

Because this is a through hole, inserting tang on the insert must be broken off. Tangs are removed either with pliers or with tang break-off tools. Break-off tools are used mostly for the smaller sizes of thread inserts.

Prewinding Tool—Free diameters of inserts are slightly larger than the holes into which they are inserted. Tool used in the installation operation is a prewinding device that reduces free diameter of the coil to slightly less than the tapped receiving hole before it is turned into the hole. Once in place in the hole and released from the tool, the insert expands against the female receiving threads, because of its spring-like action, and automatically locks itself in place. No amount of vibration or turning will dislodge the insert.

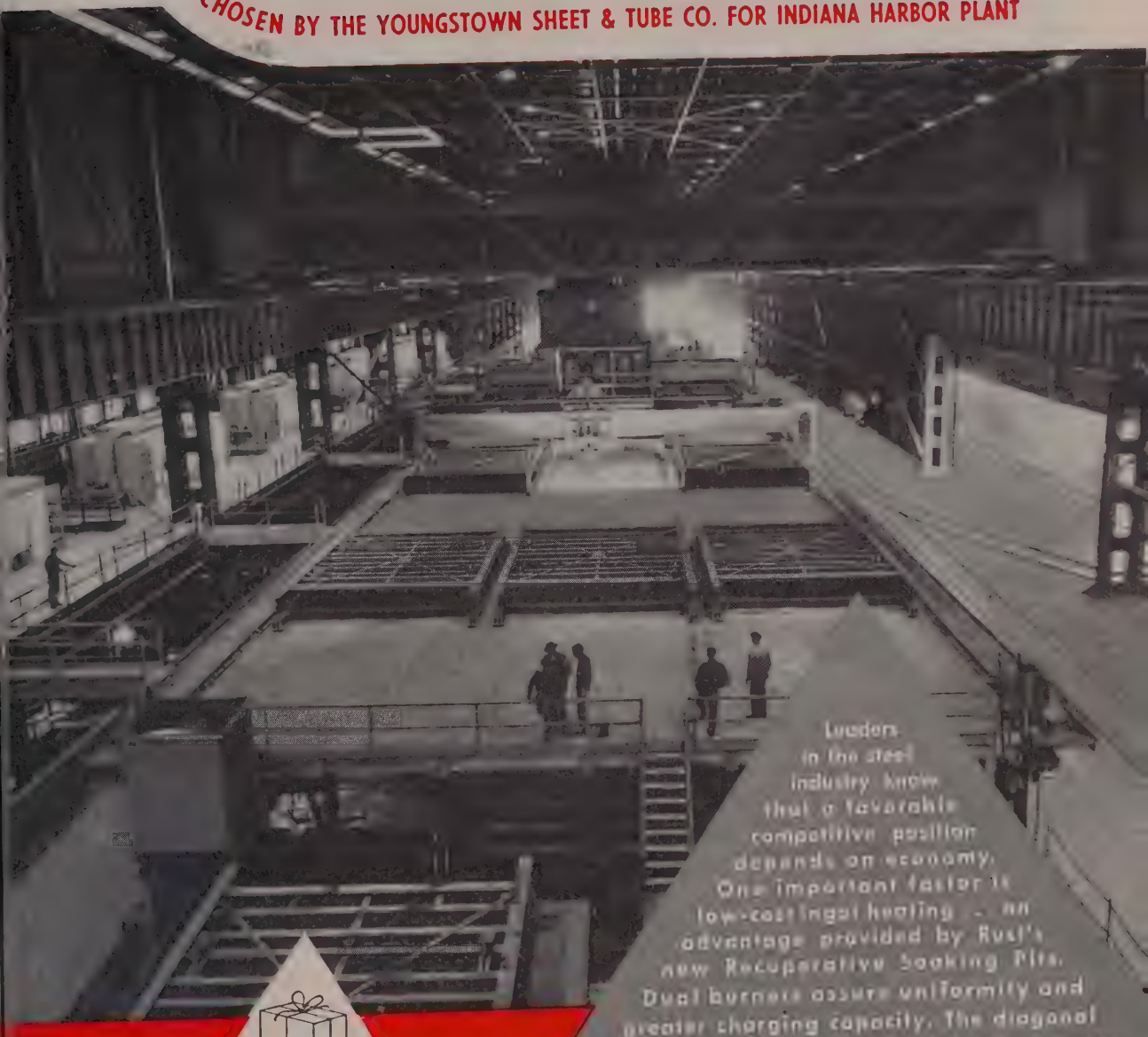
Caterpillar reports these stainless steel thread liners provide threads with substantial loading strengths because of good thread flank contact. In addition, characteristics of 18-8 stainless steel wire permit them to resist high temperature corrosion, seizing and wear.

Special and supplementary tools are used for this repair job because of the nature of the application. However, most thread repair operations require only the use of standard taps and tools.

CONTINUOUS 2-WAY TOP-FIRED

RUST ... Recuperative Soaking Pits

CHOSEN BY THE YOUNGSTOWN SHEET & TUBE CO. FOR INDIANA HARBOR PLANT



Leaders in the steel industry know that a favorable competitive position depends on economy. One important factor is low-cost ingot heating — an advantage provided by Rust's new Recuperative Soaking Pits. Dual burners assure uniformity and greater charging capacity. The diagonal two-way firing means balanced heat . . . ingots soak out evenly. Absence of impingement increases life of refractory walls and covers. Design permits construction in batteries of two or more holes and use of all fuels. Control is fully automatic for trouble-free operation.

Rust builds furnaces for every metallurgical heating need

RUST "PACKAGE" CONTRACT

One contract covers everything . . . from blueprint through start up. Rust assumes responsibility for design, manufacture, erection, and is prepared to undertake all phases of the work with its own forces, including wiring and piping. This results in substantial savings . . . One profit instead of pyramiding ones which accrue where many

RUST FURNACE COMPANY

Pioneers in Furnace Design

RUST BUILDING • PITTSBURGH, PA.

From deep inside a mountain—

GOOD NEWS FOR ALUMINUM USERS

The availability of aluminum will be increased materially by new production facilities already well into construction at Kitimat, in the mountain wilds of British Columbia. There Aluminum Company of Canada, Ltd. ("Alcan"), whose products we distribute, is building a new plant, which in its initial phase will provide 200 million pounds more aluminum per year.

Abundant low-cost power is needed to produce aluminum economically. To serve Kitimat, a great hydroelectric plant will be installed inside a mountain. Water will travel through ten-mile tunnels, such as the one shown above, and drop half a mile to the power house, located inside a cavern.

Meanwhile, from existing facilities, millions of pounds of Alcan aluminum are helping to keep over a million metal-workers busy in American foundries and fabricating plants, turning out thousands of lightweight, long-lasting aluminum products for defense, industry, farm, and home.

ALUMINUM IMPORT CORPORATION

Distributing company of the **ALUMINIUM LIMITED** *group, in the Western Hemisphere*
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CARBON STEEL BARS . . .

(Continued from p. 107)

ganese sulphide inclusion frequency than equivalent grades of normal sulphur steels.

Theoretically, manganese sulphide inclusions serve to interrupt the prevailing ferrite matrix which causes a premature breaking of chips. Also, they minimize metal build-up at the cutting edge of the tool and provide lubrication during cutting.

Weldability decreases with increasing sulphur. However, with special technique resulphurized steels can be successfully welded.

Silicon — Silicon is one of the principal deoxidizers used in steel. Amount of it present, together with aluminum, determines the type of steel. Rimmed and capped steels contain no significant amounts of silicon, while semi-killed steels contain a moderate amount of silicon although there is a definite maximum. Killed carbon steels may contain any amount of silicon up to 0.60 per cent; however, the range is usually 0.10 to 0.30 per cent.

Silicon is somewhat less effective than manganese in increasing strength and hardness. In low carbon steels, silicon is usually detrimental to surface quality. This is especially true for the low carbon grades which are resulphurized. Moreover, it is general practice to produce all resulphurized free cutting steels to a low maximum of silicon, which contributes to improved machinability.

New Plastic-Metal Laminate

Method of laminating vinyl plastic and sheet steel or aluminum which will make these metals colorful, decorative and permanently rust and corrosion proof was developed by the Naugatuck chemical division, United States Rubber Co.

The process combines the structural strength of metal with the bright colors and exceptional corrosion resistance of vinyl plastic.

Some of the products which can be made from the plastic-metal laminate are decorative and weatherproof building siding, interior paneling, office and industrial machine housings, inexpensive corrosion resistant containers for chemicals and chemical piping.

40% to 70% cost-saving with Edmont work gloves

job-fitted to your needs

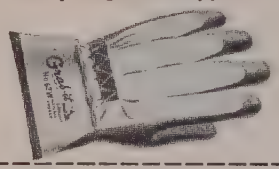
NEOX (reinforced neoprene) coated gloves fit widest range of work

Never before a glove so equally resistant to abrasion, cutting, oil, acids, solvents, caustics, degreasants and heat. Good flexibility and grip. All Edmont coatings are bonded to strong fabric linings for comfort and snag-resistance. Full coated or palm coated.

"Redmont" NEOX gloves for heaviest duty service and safe grip

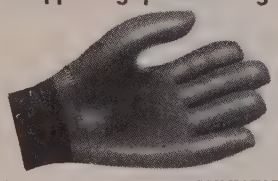
Non-slip finish, cured *into* 30% thicker red NEOX coating, grips wet or greasy surfaces as well as dry. Longest wearing, safest of all liquid-proof gloves. Seamless wearing surface, extra wide thumb span, curved fingers.

Safety engineers approve white-fabric lined, rubber-coated Grab-its



Tough, flexible, rough-textured natural rubber, bonded to sturdy white fabric lining, gives positive non-slip grip, wet or dry. Outwear ordinary canvas gloves up to 10 times. Far safer, too.

Grapplers grip even in grease; outwear other plastics 50%



Coated with DUROX, a leather-like reinforced plastic that retains its grip when wet, is extremely resistant to abrasion, oil and coolants, and stays flexible. Perfect fitting, too. Note wing thumb and curved, pre-flexed fingers.

Hand-fitting Monkey Grips far outwear leather, ordinary plastics

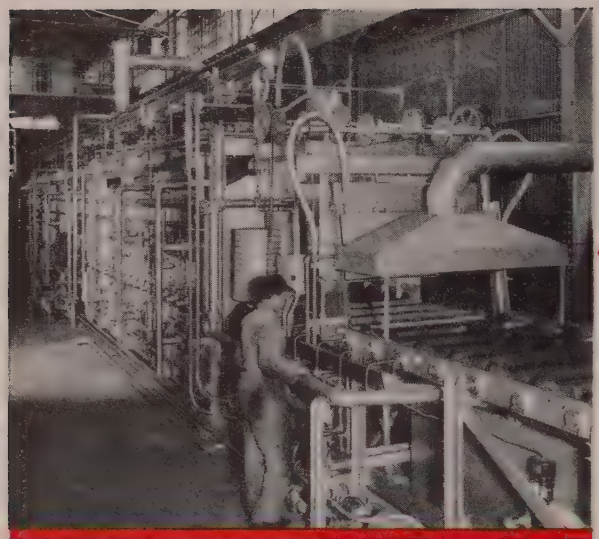
Special Edmont vinyl coating is second only to "DUROX" in wearing qualities and grip. Same wing thumb and pre-flexed finger design as "Grappler" gloves; fit the hand *all over.*

Make this FREE TEST to cut your costs, improve safety. Send us a brief description (on business letterhead) of your operations, materials handled, and temperature condition. Without cost we will recommend the best glove for the condition and forward samples for testing on the job.

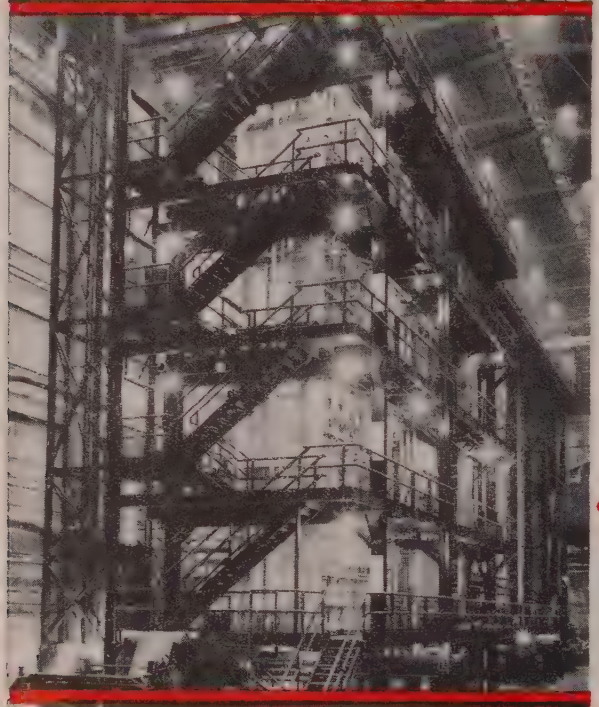
Edmont Manufacturing Company, 1261 Walnut Street, Coshocton, Ohio

World's largest maker of coated industrial gloves

Edmont job-fitted gloves



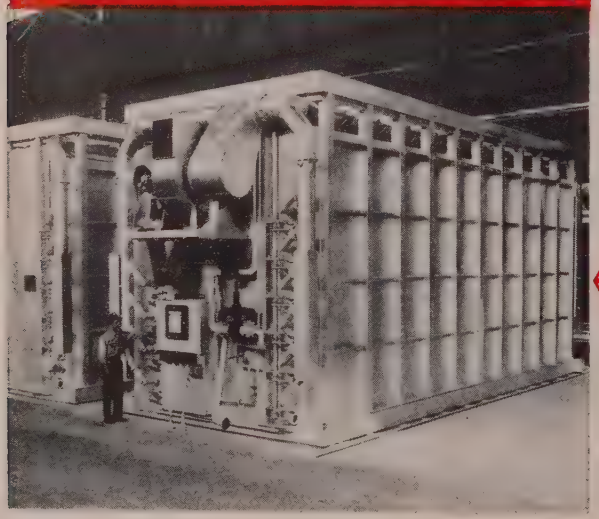
The first continuous carbon restoration annealing of steel was carried out in this Surface roller hearth furnace. Enriched RX atmosphere is the recarburizing medium; NX atmosphere is for surface protection.



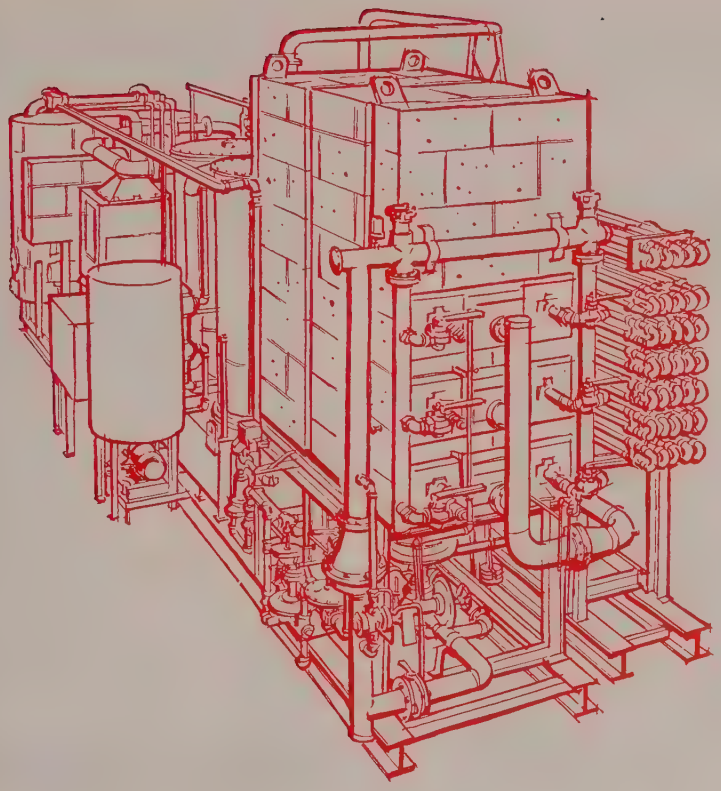
This is a Surface HNX Generator—one of the many types of generators which Surface Combustion supplies to help the industry deliver better finished steel.

SALES TOOL

This vertical strand furnace is used for continuous bright annealing of strip for tin plating. Either NX or HNX gas can be used for the prepared atmosphere.



Batch bright annealing coiled strip is carried out in these lift type cover furnaces. This installation uses NX protective atmosphere.



ON THE MILL FLOOR

New markets open and customers are retained by developments on the mill floor. Steel surface quality, a major factor in customer acceptance, can be economically controlled through prepared atmospheres.

Many steelmakers have eliminated discoloration, "decarb," scale and other surface defects by using Surface Combustion prepared atmospheres. They have improved quality control, cut finishing costs by carbon correction and bright annealing, continuous or batch . . . clean hardening . . . clean annealing for galvanizing or tin plating.

Their customers know that this steel means lower tool and die costs, fewer rejects—more steel, in effect, for their dollar.

'Surface' builds many types of atmosphere generators, including RX, DX, NX, HNX, and AX generators for the steel industry. Literature Group S53-3 will show you how to get the right atmosphere for satisfied customers and new markets.

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One-way fired soaking pits • Billet reheating furnaces • Slab heating furnaces • Continuous type, controlled atmosphere strip annealing and normalizing furnaces • Controlled atmosphere annealing covers for wire and rod • Controlled atmosphere annealing covers for coil and sheets • Continuous furnaces for heat treatment of steel plate • Controlled atmosphere furnaces for carbon correction in high alloy rod and bar stock • Continuous type bright annealing and normalizing furnaces • Prepared gas atmosphere generating equipment • Pit type convection furnaces for rod annealing • Stress relief furnaces • Wire patenting furnaces

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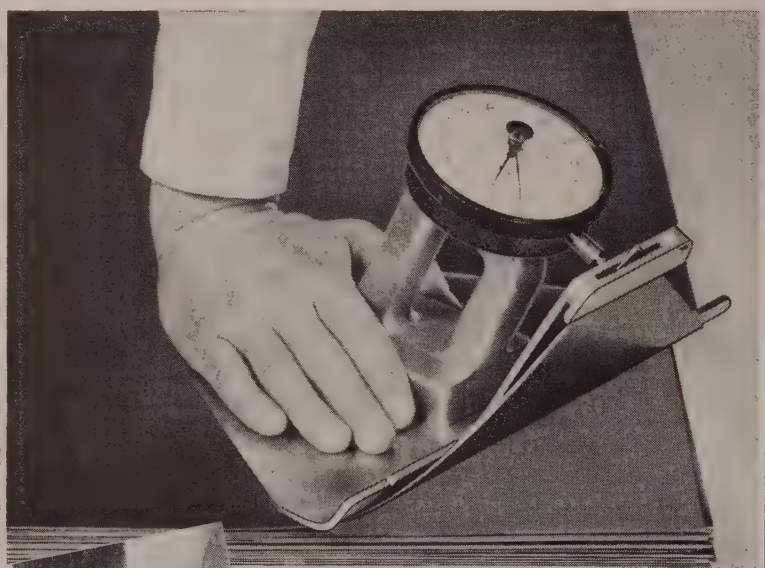

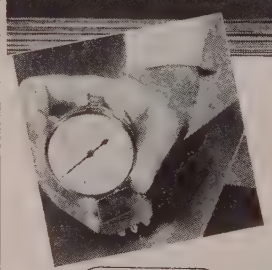

FLEX-TESTER does its job quickly. Can be used to select sheets suitable for forming desired part. User can save better material for more severe draws; use poorer grade for simpler work. Enables application of material of uniform quality. Determines need for roller leveling, particularly on exposed panels where stretcher strain is detrimental. Hand operated; light weight; easily carried. Proven in use on hundreds of jobs. Write for descriptive bulletin or demonstration in your plant.

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Steel City Testing Machines Inc.

8819 LYNDON, DETROIT 21, MICH.

Belt Grinding Progress

Experience not only proves the practicality of carbide sharpening, it offers some new ideas

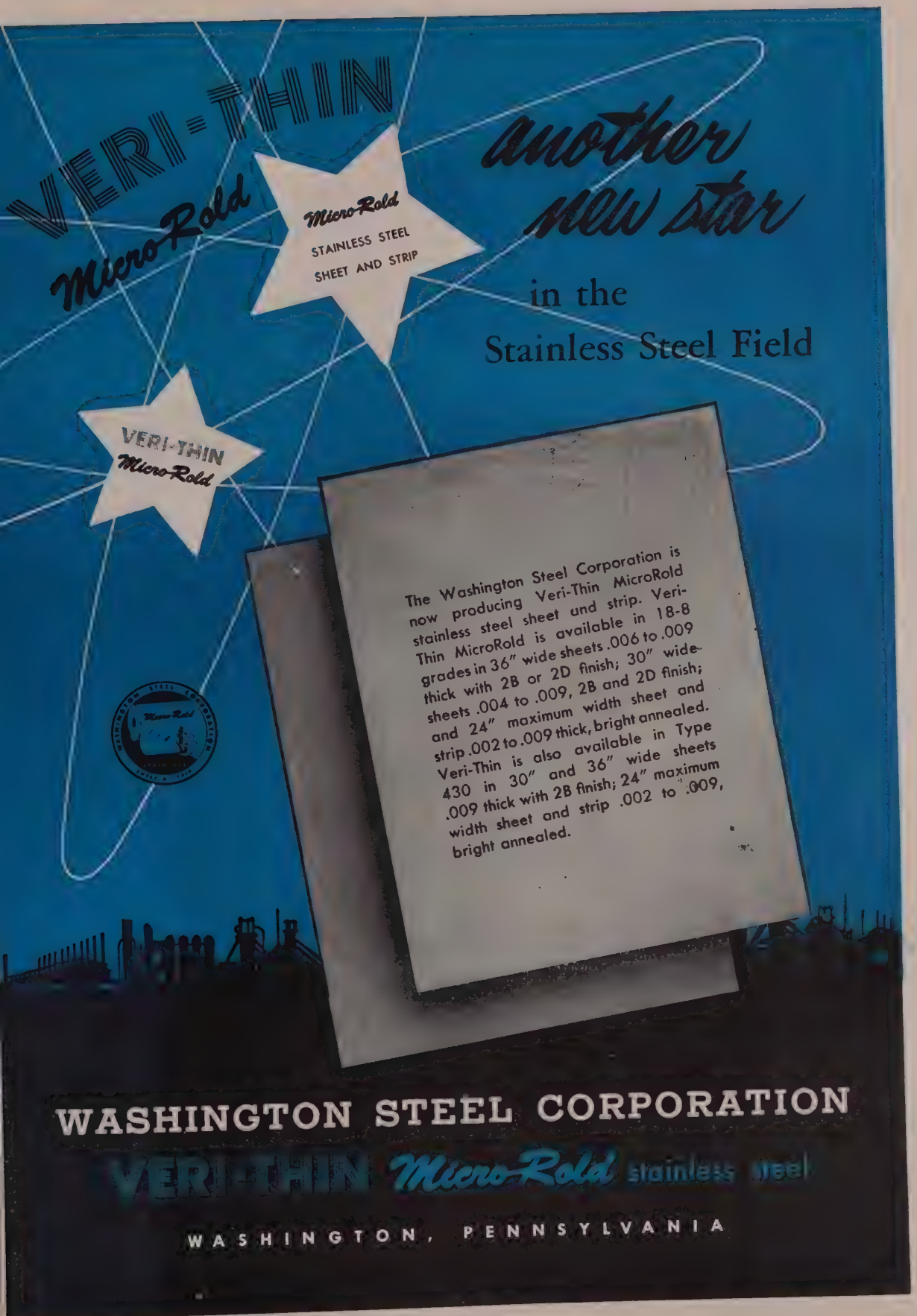
FIRST SIX MONTHS of widespread experience with the abrasive belt method of sharpening tungsten carbide-tipped tools not only proved it practical, but also resulted in numerous refinements.

Belt life, at first expected to be short, has proved better than development engineers anticipated. Where normal rough grinding techniques are employed, belt life, in terms of cost, averages approximately one cent per tool sharpened for ¾ to 1¼-inch tool bits; belt life, in terms of cost, averages one-half cent per tool sharpened for ¼ to ⅝-inch tool bits.

High Points—In a few installations where special rough grinding practices are employed, belt life is considered excellent. One eastern metal fabricator uses an intermediate rough grind on a 100-grit silicon carbide grinding wheel between initial rough grind on a 50-grit silicon carbide wheel and the abrasive belt grinder. This user grinds about 200 single-point tungsten carbide tools of ¾ to 1½ inch size per belt.

BELT SHARPENING SETUP
. . . improved tensioning, adjustment

A manufacturer of heavy equipment reports he is sharpening approximately 150 tools per belt. To achieve this extended belt life, a three-step sharpening process is used. First step is a rough grind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The Washington Steel Corporation is now producing Veri-Thin MicroRold stainless steel sheet and strip. Veri-Thin MicroRold is available in 18-8 grades in 36" wide sheets .006 to .009 thick with 2B or 2D finish; 30" wide sheets .004 to .009, 2B and 2D finish; and 24" maximum width sheet and strip .002 to .009 thick, bright annealed. Veri-Thin is also available in Type 430 in 30" and 36" wide sheets .009 thick with 2B finish; 24" maximum width sheet and strip .002 to .009, bright annealed.
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FORGINGS Quick shipment of all analyses.

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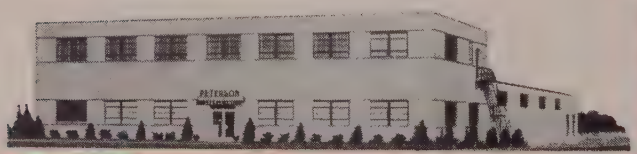


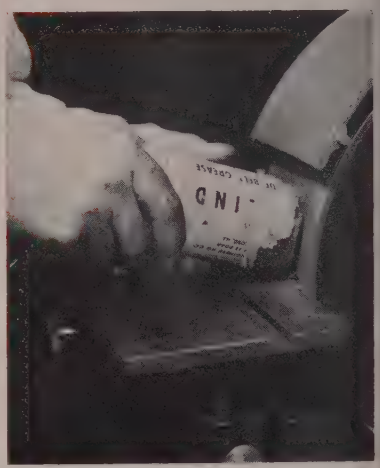
PETERSON STEELS, INC.

UNION, NEW JERSEY

Detroit, Michigan • Chicago, Illinois

on a 60-grit silicon carbide wheel dressed with a star dresser. The second step is an intermediate rough grind made with the same wheel redressed with a diamond point. Intermediate grind obtained with this procedure approximates the grind produced by a 100-grit silicon carbide wheel. In the third step, the rough ground tool is finished on the 150-grit coated abrasive belt.

Experience shows that the abrasive belt method is properly limited to the final sharpening process. It is not practical to use it for roughing or shaping tools.



APPLYING LUBRICANT
. . . improved tool finish

These operations should be done on silicon carbide wheels.

Lubrication — Accumulative experience indicates that a lubricant should be used on the belt. Lubricant appreciably increases belt life and, more important, it improves the finish on the tool. A new grease developed especially for use on carbide tool finishing belts has been introduced by Fenlind Engineering Co., Rockford, Ill. Being a light-bodied lubricant, the grease spreads over the belt thinly and retards glazing but does not interfere with the grinding action of the abrasive grain on the belt.

Applications of the new method have been expanded successfully by many users from sharpening straight-faced tools, as originally planned to simple form tools. Round-nosed tools are reported

How many turret lathes could you sell here?

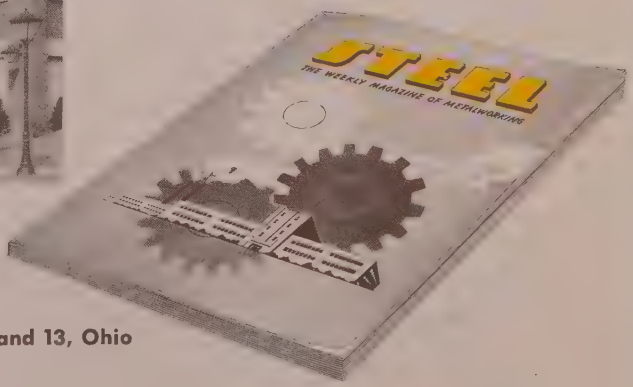
Hardly a likely prospect for metalworking sales, this placid residential district! But these homes were replaced just two years ago with the modern machine works shown below. The same rapid expansion is happening throughout Metalworking America. Weed-grown fields, outdated homes and old buildings are turning into bustling metalworking plants . . . lucrative outlets for your products. This means a whole new market is being added to the hundred-billion-dollar metalworking industry. STEEL helps you reach this expanding market *as it grows.* Through its continuing up-to-date census of metalworking, STEEL keeps close tabs on new plants under construction . . . ferrets out the men with buying influence . . . reaches these executives through distribution that is carefully controlled. Ask the man from STEEL to show you how this fast-growing magazine keeps pace with the dynamic metalworking industry.

New addition to the Textile Machine Works, Reading, Pa.

The magazine of the men who

manage, operate and buy for the

Metalworking industry . . .



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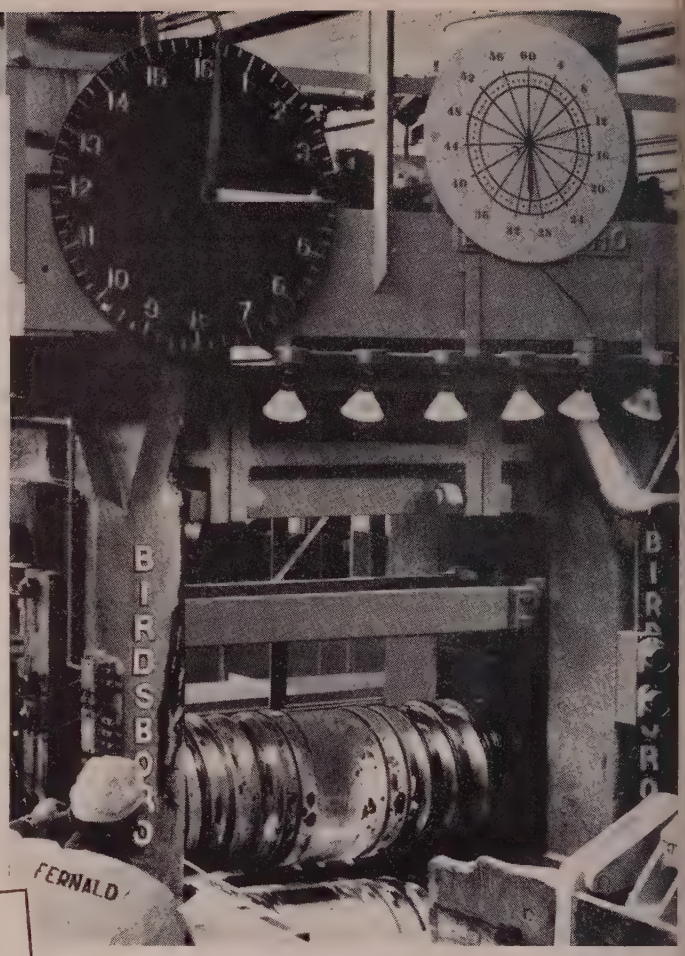
URANIUM ROLLING MILL

and the A.E.C. says:

"... an outstanding performance in designing and manufacturing a special mill to roll uranium for the United States Atomic Energy Commission."

"... an extraordinary achievement in terms of speed ... a credit to your Company, and to the high ability of your staff."



UNITED STATES
ATOMIC ENERGY COMMISSION
NEW YORK OPERATIONS OFFICE

April 3, 1953

Mr. J. M. McCauley, President
Birdsboro Steel Foundry & Machine Company
Birdsboro, Pennsylvania

Dear Mr. McCauley:

It is with pleasure that I commend Birdsboro Steel Foundry & Machine Company, and in particular the Engineering Department of its Rolling Mill Division, on an outstanding performance in designing and manufacturing a special mill to roll uranium for the United States Atomic Energy Commission. Not only was this an extraordinary achievement in terms of speed, but the costs of the mill have been held well in line with the original estimates which were projected from quite sketchy information. This is indeed a credit to your Company, and bespeaks the high ability of your staff. . .

Again I wish to thank and commend you, and through you the Birdsboro staff, on an excellent job.

Very truly yours,

H. B. Fry
Manager

M:HBF:ab

•This primary Birdsboro mill, followed by a continuous Birdsboro finishing mill, built under contract for Catalytic Construction Co., is used to roll uranium into bars for further fabrication into slugs used in nuclear reactors.

BIRDSBORO brought more than 58 years of experience and engineering skill to bear on the task of producing the new uranium rolling mill for the A.E.C.'s uranium production center at Fernald, Ohio. Today, the mill—first and only one designed for production rolling of uranium—is in steady, high volume production.

Now, as in the past, BIRDSBORO offers you this same experience and know-how in your search for better, lower-cost mill rolling operations. Make it a point to call in BIRDSBORO engineers.

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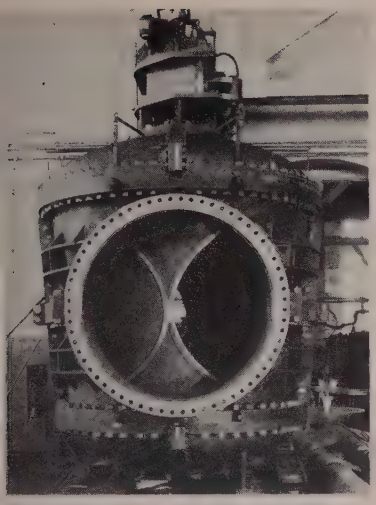
•designers and builders of: Steel Mill Machinery • Hydraulic Presses • Crushing Machinery • Rolls • Special Machinery • Steel Castings



Irrigating Afghanistan

One of the largest Rotovalves ever made is seen at S. Morgan Smith Co., York, Pa. Valve is 84 inches across the opening, weighs 210,000 pounds. It is one of three being readied by Smith for the government of Afghanistan, where they will be installed at Kajaki dam to control water flow in a 500,000-acre irrigation project

especially adapted to abrasive belt sharpening. Several manufacturers are sharpening angular form tools, which can be done successfully if cutting edges are straight and can be presented to the abrasive belt.

Refinements — Several refinements in design of its original machine were introduced by Behr-Manning Corp. during the first six months of industry use. Grinder is now equipped with an automatic belt tensioning device and is fully guarded. Angle adjustment gage indicates relief angles up to 20 degrees and extensions are now built onto the table to accommodate offset tools.

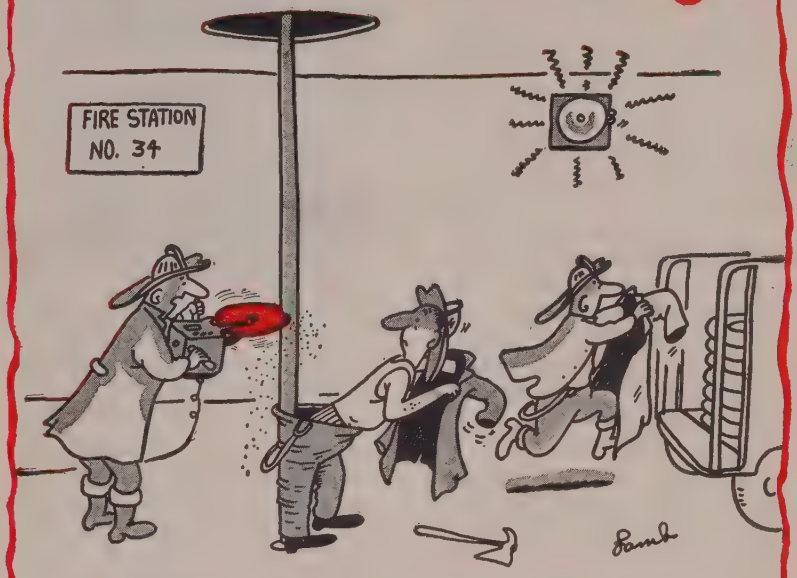
Tough Tape for Floor Marking

Development of a tough pressure sensitive tape to meet the severe service requirements of marking floor areas and overhead limits in industrial plants and other buildings has been put on the market by Permacel Tape Corp., New Brunswick, N. J.

The new product known as Permacel 32 colored plastic tape, is unaffected by ordinary solvents, acid, grease, oil, water or alkalies, and it is easy to put down.

the *tougher* the cutting job . . .
the *better* the opportunity for . . .

Abrasive Cutting



"FOR HEAVEN'S SAKE, SAWYER . . . HOW DID YOU GET INTO THIS FIX?"

Unusual cutting conditions like this are the exception . . . but whether you have a specialized application or a mass production job, you can depend on Allison Wheels. Whatever the material to be cut, there is an Allison Abrasive Cutting Wheel processed and formulated to fit the job. This means faster cutting with fewer rejects and reduced operating costs.

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Million-Pound Calibrators

Strain gages are not new, but NBS amplifies their use in its no-limit calibrating program

DEVELOPMENT of load calibrating devices of unusual size and capacity by National Bureau of Standards will permit standardization of the largest materials testing machines in existence. The four NBS 3 million pound capacity compression dynamometers can accurately measure forces up to 6000 tons.

Prior to development of these dynamometers, which make use of attached wire-resistance strain gages as a part of their load-indicating systems, the highest load that could be measured accurately was approximately 2½-million pounds, says NBS. To do this required simultaneous use of a considerable number of calibration devices (such as proving rings) of 200,000- and 300,000-pound capacity.

Cost Halved — It is estimated that a testing machine can now be calibrated to 10 million pounds by the new dynamometers in about one-fourth the time and at about half the cost formerly required to calibrate it to 2.5 million pounds.

Close-up of the 3-million-pound dynamometer with cover removed shows parallel and lateral bonded strain gages mounted on the column which is flared to gain larger bearing areas

High-capacity testing machines are both important and necessary to engineering research. One reason is that mechanical properties of materials as determined from tests of small specimens do not always give a complete picture of what may be expected from a structure fabricated from large rolled sections or forgings. The strength of the material of a large I-beam, for example, may vary across its section and the mechanical properties of a large forging may vary with direction in the forging, etc.

It has been the experience of research engineers that the soundest approach to the solution of this problem is to apply actual service loads to full scale specimens which have been fabricated from the same type of materials that would go into the real structure. This means that in the case of such structures as welded ship hulls and aircraft fuselage and wing components the loads required will be very great.

Critical Areas — Still another reason for emphasis on testing full-scale units is the fact that failure of such structures in service is sometimes due not to lack of strength in the material but

MAY-FRAN
HINGED-STEEL CONVEYOR BELTS

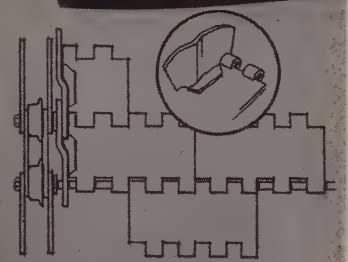
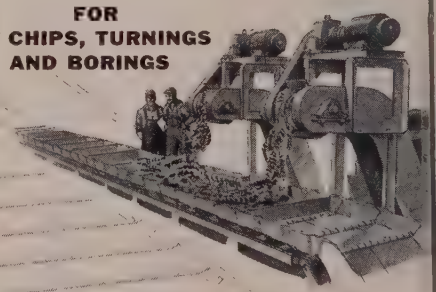
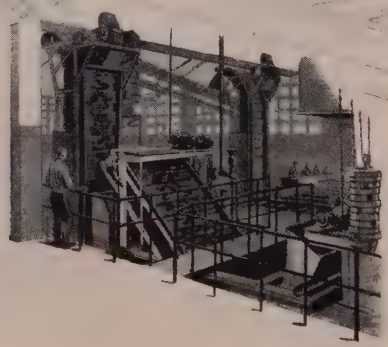


Diagram shows assembly of links, rollers, chain and side wings.

FOR CHIPS, TURNINGS AND BORINGS



FOR MASS-PRODUCED PARTS

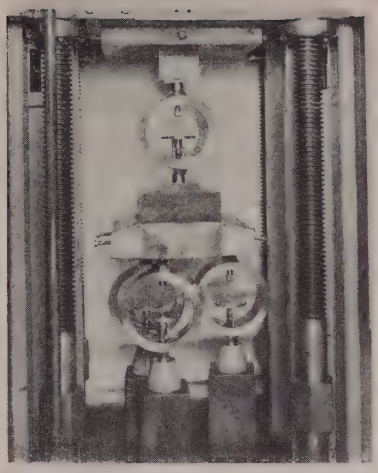


rather to points of high stress. These critical stress areas are caused by designs which include sharp angles or notches introduced into the structure during machining or welding.

Points of high stress may operate in various ways: A complicated shape welded together may shrink as it cools in such a way that parts of the structure are stressed almost to failure before any external load is applied; or a notch cut in an airplane wing hinge may concentrate stresses two or three times as great as the average computed stress. It is impossible to reproduce, in a small scale model, the effects of welding stresses or machining notches.

The structural engineer is thus forced to conduct his research on examples of the full structure. Here he finds he must apply loads ranging from a minimum of a few hundred thousand pounds up to 5 or 10 million pounds.

Essential Function — In order that results obtained in research on examples of full structure may be considered reliable and intercompared with results from different laboratories, it is necessary to control the accuracy of the testing machines.



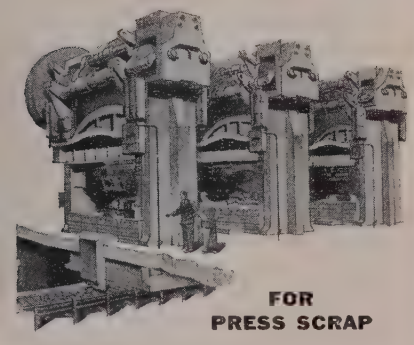
Machine setup shows how a 200,000-pound-capacity proving is calibrated by loading it against three 100,000-pound rings. Each of the smaller r ngs has been calibrated by dead weights

It is a simple matter to calibrate smaller machines by use of proving rings, but calibration of the larger machines presents definite obstacles. Proving rings are made in capacities up to 300,000 pounds and although it is possible to calibrate above this limit by loading several rings simultaneously (the method has been employed up to about 2.6 million pounds) the process is costly and difficult.

Promising Solution—About 1940 the bonded wire strain gage became a working reality. The gage consists of a grid of fine wire cemented to the surface of a specimen.

As the material of the specimen becomes strained under load, the wire is likewise strained or stretched, thus changing its electrical resistance. Change of resistance bears a simple relationship to strain in the specimen and can be measured by suitable instruments.

Possibility of utilizing a uniformly stressed column having gages attached in such a way as to respond to the average strain on the column seemed a most promising solution to the problem of measuring loads of a million



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CHIPS, TURNINGS AND BORINGS are continuously and automatically removed from operating machine tools with MAY-FRAN CHIP-TOTES. These outstanding units speed production by eliminating machine down-time for manual scrap removal. MAY-FRAN Conveyors can then transmit scrap to ultimate point of disposal.

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A single call to a Murray warehouse can bring you everything needed in stainless pipe, tubing and fittings — and you can be sure of quick delivery from Murray's large stocks and complete range of sizes! Hundreds of tube users — both large and small — repeatedly rely on Murray for this dependable service.

When in need of stainless pipe, tubing or fittings — for pressure or mechanical purposes—call a Murray warehouse first and be sure of quick and dependable tubing service.

Photo courtesy of Shell Oil Co.

WRITE FOR CURRENT STOCK BULLETIN

7270

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ESTABLISHED 1845
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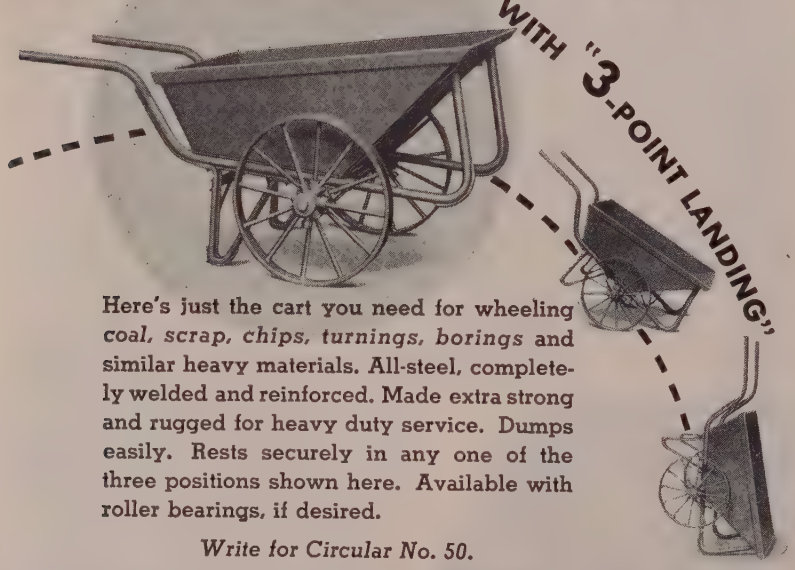
Other Murray products include boiler and pressure tubes, IPS pressure tubing, seamless cold-drawn and hot finished mechanical tubing, seamless and welded pipe, JIC hydraulic tubing, carbon steel welding fittings and all types of tube fabricating.

NEW HEAVY-DUTY CART WITH "3-POINT LANDING"



Here's just the cart you need for wheeling *coal, scrap, chips, turnings, borings* and similar heavy materials. All-steel, completely welded and reinforced. Made extra strong and rugged for heavy duty service. Dumps easily. Rests securely in any one of the three positions shown here. Available with roller bearings, if desired.

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Sterling WHEELBARROWS

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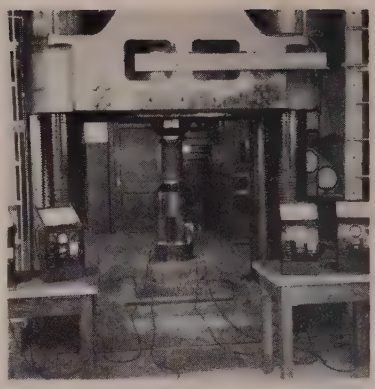

This setup in 10 million-pound testing machine shows calibration procedure for a 3-million pound dynamometer. Electrical indicators are located on tables in the foreground

pounds or more. It was known that a device designed in this fashion could work to a much higher load in proportion to its own weight than a proving ring and, since output of the strain gages would be correlated directly against load, no assumption needs to be made as to the gage factor.

Therefore NBS instituted a project to develop load measuring devices of this type that would permit calibration to capacity of the largest testing machines. Objective was to design devices that would achieve stability and accuracy of the proving ring, about 1/10 of 1 per cent.

Progress — The program has now reached the point where eight devices are complete and calibrated, four with a capacity of 1 million pounds each and four with capacity of 3 million pounds each. Together, the latter four offer a total capacity more than enough to calibrate to capacity the largest testing machine in existence.

Use of wire strain gage devices for the measurement of load is by no means new; such devices were being produced commercially for weighing and balancing at the time the Bureau started development of the compression dynamometer.

The unique features of the NBS devices are application of the method to measurement of very high loads, procedure used to calibrate the devices, and the particular feature of design in which the highly stressed column is flared

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SIMPLICITY

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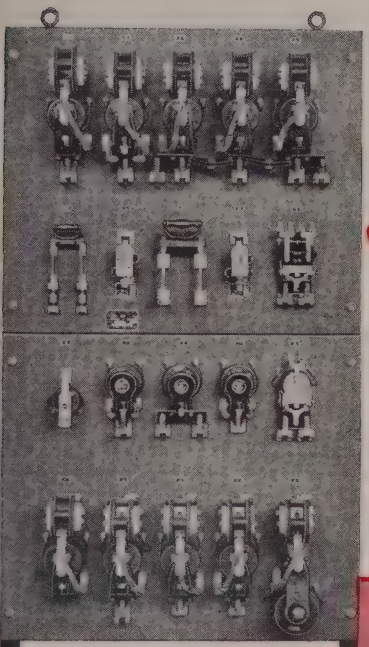


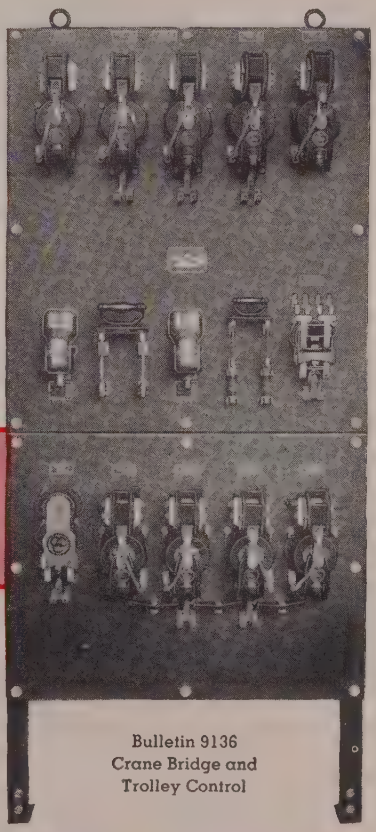
Bulletin 9135
Crane Hoist Controller

STABILITY

A single, simple relay of rugged, heavy mill-duty type design and construction gives fast, accurate reversing and plugging. Smooth, dependable, efficient operation results—with more protection for motors, minimum maintenance and less down time.

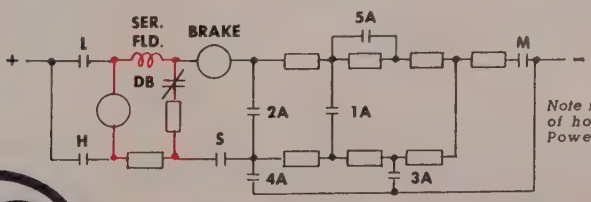
AVAILABILITY

Standard Panels as shown are available for Traveling Overhead Cranes. Engineered Panels for large Coal Bridges, Ore Bridges, etc., are CLARK Specialties.



Bulletin 9136
Crane Bridge and Trolley Control

SMOOTH ACCELERATION plus SAFE DYNAMIC BRAKING on the Hoist are the ideal combination for outstanding crane performance.

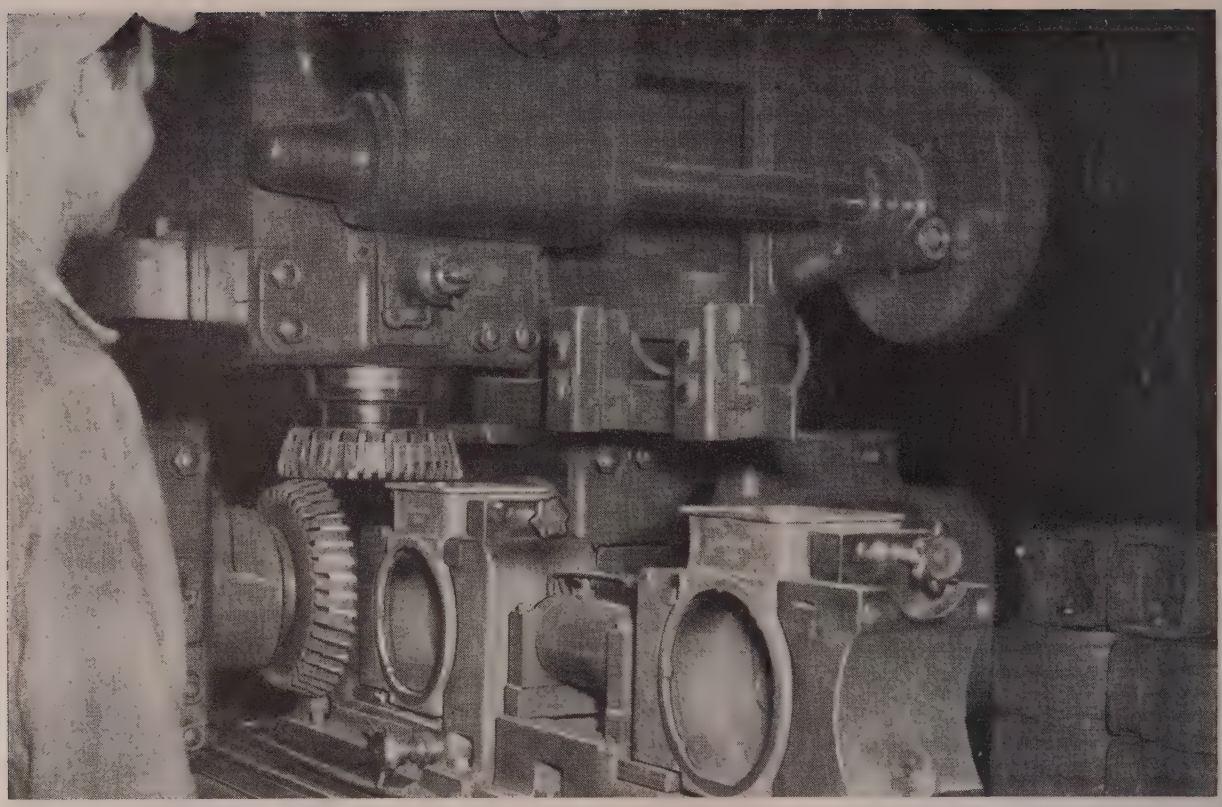


Note the simplicity of hoist circuit in Power Diagram.

***CLARK** Crane Control Engineers Are Yours to Command*

THE CLARK CONTROLLER CO.

ENGINEERED ELECTRICAL CONTROL • 1146 EAST 152ND STREET, CLEVELAND 10, OHIO



450 pieces per grind...

Despite Vibration

HAYNES STELLITE alloy milling cutter blades are being used successfully to machine gas-meter bodies, despite considerable vibration. The meter bodies have thin walls with respect to their other dimensions, and even though they are held in a rigid fixture, vibration cannot be completely eliminated. HAYNES STELLITE alloy tools have the toughness to withstand the chatter and also the red hardness to do the job fast.

Three milling heads, each containing 36 standard HAYNES STELLITE blades, face the flange at the top of the meter and straddle mill the two sides simultaneously. The tools previously used produced as few as 14 pieces per grind. HAYNES STELLITE tools produce an average of 450 pieces.

For information on how to use HAYNES STELLITE tools on your machining jobs, write for the new manual, "HAYNES STELLITE Metal-Cutting Tools."

HAYNES
TRADE-MARK
alloys

Haynes Stellite Company
A Division of
Union Carbide and Carbon Corporation
UCC
General Offices and Works, Kokomo, Indiana
Sales Offices
Chicago — Cleveland — Detroit — Houston
Los Angeles — New York — San Francisco — Tulsa

"Haynes" and "Haynes Stellite" are trade-marks of Union Carbide and Carbon Corporation.

out at top and bottom to integral ends having bearing surfaces of relatively large area.

Low Stress—This design results in relatively low stresses between the device and bearing blocks through which they are loaded by the testing machine. Thus accurate and reproducible results are obtained. Dynamometers are used in conjunction with an electrical indicating instrument, modified from the ordinary commercial strain indicator for strain gages.

The electrical instrument is used to measure the small shift of balance of a bridge circuit composed of elements of resistance wire strain gages attached to a highly stressed portion of the dynamometer.

By mounting some gages in such a way as to measure the compressive strains parallel to the load axis of a compression column, and other gages to measure tension strains caused by the lateral expansion of the same column, a bridge having a maximum output and good temperature compensation can be formed.

Calibrating — The devices are calibrated by extending the method developed for large proving rings which exceed the capacity of the bureau's 111,000-pound dead-weight testing machine. In calibrating a 300,000-pound ring, the ring is first calibrated as far as possible by dead weights. It is then set up in a testing machine and loaded against three 100,000-pound proving rings, which have been previously calibrated to capacity by dead weights.

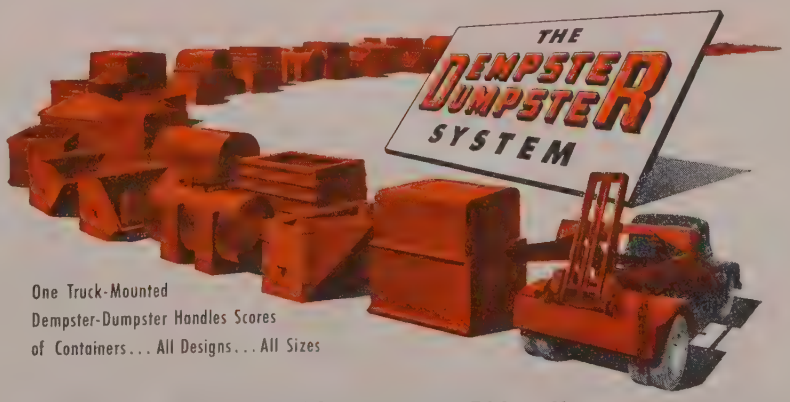
Load exerted by the machine is transmitted through the 300,000-pound ring and shared equally by three 100,000-pound rings. All four rings are read at once and load is computed from readings of the three smaller rings. In this way, a calibration may be secured to 300,000 pounds and errors of testing machine do not affect result.

In extending the process, four large rings are calibrated by this method, then used together to calibrate a 1 million-pound wire strain gage dynamometer. Three or four of these, in turn, are used to calibrate the 3 million-pound device.

Here's a One-Man Bulk Materials Handling System for Your Plant

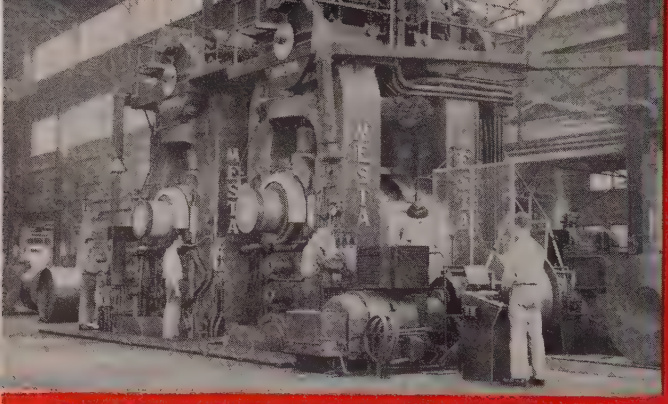
IN THE Dempster-Dumpster System of bulk materials handling only one man, the driver of the truck-mounted Dempster-Dumpster, is required for operation. The Dempster-Dumpster serves scores of detachable Dempster-Dumpster Containers. Container capacities range up to 4 times that of conventional dump truck bodies and each container is designed to suit the materials to be handled—be they solids, liquids or dust . . . hot or cold . . . bulky, light or heavy. You simply place these containers at convenient materials accumulation points inside or outside buildings. When loaded each container is picked up, hauled and emptied (as shown above) or load set down intact. Entire operation is handled by hydraulic controls in cab.

Containers shown below are just a few of the many available or that can be built to meet your needs. They enable you to handle, at tremendous savings, materials of many descriptions—trash and waste materials, raw materials, finished products, etc.—with only one truck and only one man, the driver. Write to us for complete information. Manufactured exclusively by Dempster Brothers, Inc.



One Truck-Mounted
Dempster-Dumpster Handles Scores
of Containers . . . All Designs . . . All Sizes

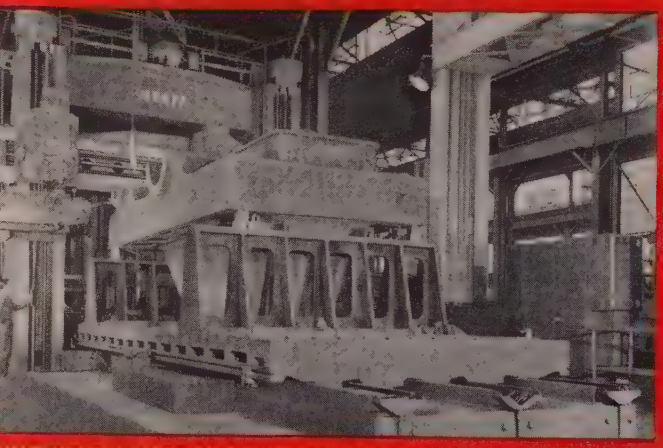
DEMPSTER BROTHERS, 693 Dempster Bldg., Knoxville 17, Tenn.



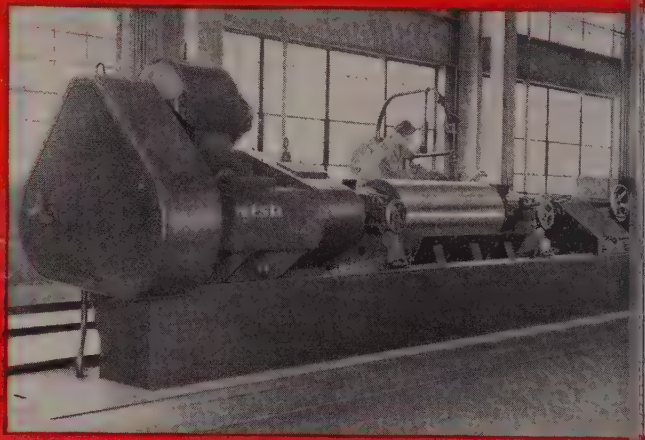
MESTA 42" FOUR-HIGH TWIN-STAND HIGH-SPEED SKIN PASS MILL

MESTA 56" FOUR-HIGH, FIVE-STAND HIGH-SPEED TANDEM COLD MI

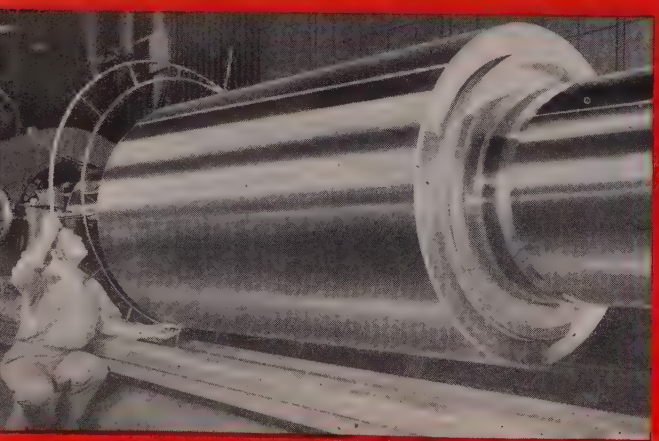
Designed and Built By



MACHINING A LARGE GEAR DRIVE BASE ON A MESTA HEAVY DUTY PLANER



MESTA HEAVY DUTY TRAVERSING WHEEL TYPE ROLL GRINDER



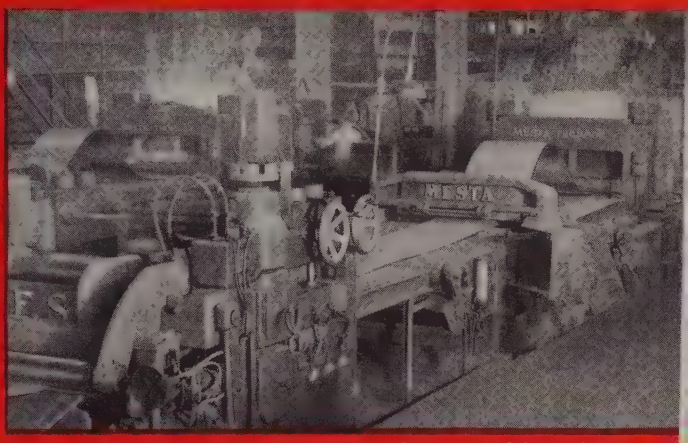
FINISH GRINDING A LARGE MESTA SPECIAL ALLOY CAST STEEL

FOUR MESTA HIGH-SPEED CONTINUOUS PICKLING LINES, WITH

MESTA 110" FOUR-HIGH REVERSING PLATE MILL

MESTA 68" FOUR-HIGH CONTINUOUS HOT STRIP MILL, UNIVERSAL STAND

WORKING A HEAT OF HIGH QUALITY STEEL IN THE MESTA OPEN HEARTH DEPARTMENT

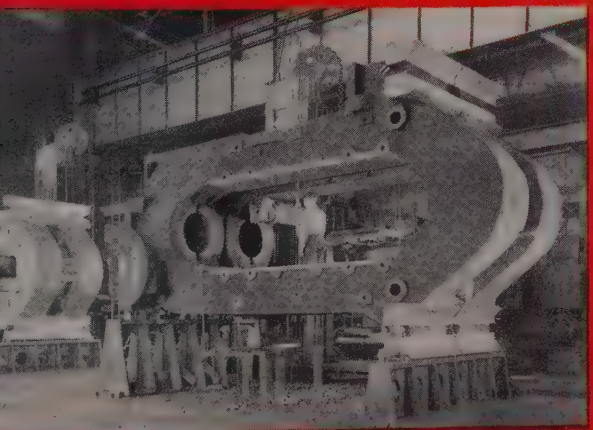


MESTA-THOMSON FLASH WELDERS LOCATED AT THE ENTRY END OF TWO MESTA CONTINUOUS PICKLING LINES

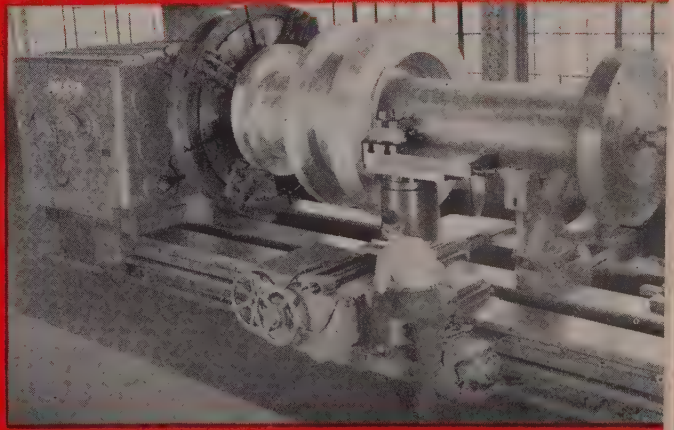
MESTA

MESTA MACHINE COMPANY

PITTSBURGH, PENNSYLVANIA



ULTANEOUSLY MACHINING ROLLING MILL HOUSINGS IN PAIRS ON MESTA HEAVY DUTY DRAW-CUT SHAPERS



TURNING A MASSIVE ROTOR SHAFT FORGED FROM INGOT POURED IN THE MESTA OPEN HEARTH DEPARTMENT

Loading prefab metal sections at Bargar Metal Fabricating Company, Cleveland.

TOWMOTORS IN ACTION IN U. S. INDUSTRY

Low-Down on the Load-Up

It used to take three men five hours to load one trailer. Now, three men and a TOWMOTOR load FIVE in the time it took for one!

TOWMOTOR has *everything*—TowmoTorque, the new drive that saves shifting time and energy! Creep-Control, so you can ease in and up with loads simultaneously! Exclusive TOWMOTOR Power Steering, to save wear and tear! New "Cushioned Power" Diesels for greater power and economy! When you consider original investment plus cost of operation and maintenance, TOWMOTOR handles more tons per dollar. Write today for book on TowmoTorque and Power Steering. TOWMOTOR CORPORATION, Div. 1609, 1226 E. 152nd Street, Cleveland 10, Ohio.

TOWMOTOR
THE ONE-MAN-GANG ®

FORK LIFT TRUCKS and TRACTORS
SINCE 1919

TOWMOTOR ENGINEERED FOR QUALITY PERFORMANCE

Conveying Heaters

Example of importance of conveyor equipment in oven manufacture is this installation in a Detroit auto plant. Unit bakes finish on heater motors, conveys and rotates them while they pass through water wash spray booths. Oven equipment, supplied by Michigan Oven Co., then moves parts to a cooling chamber before unloading

Polishing Aluminum

ALUMINUM extrusions, used in manufacture of metal doors, window frames and ornamental trim, are normally given a satin or anodized finish which requires preparatory grinding, sanding or polishing. Because these extrusions usually come in 21-foot lengths, the handling problem for any form of grinding has been difficult and costly.

No Backstand Operations—The operation can now be performed at a reported substantial saving in production cost with the Curtis Straight-O-Matic machine used with Carborundum's abrasive cloth belts. This setup is said to accomplish the polishing so rapidly it has eliminated the five to six backstand operations formerly needed to meet production requirements.

One pass with a 120-grit belt, at feed speed of 10 to 15 fpm is usually sufficient to remove surface imperfections or scratches from the extrusions. Surface finish requirements are dependent on whether or not the material is to be anodized. Experience indicates that surfaces obtained with 120 to 400 grit are suitable for anodizing.

Inspecting a roll

A HARD MAN TO PLEASE

Roll inspection is as thorough and painstaking as every other step in roll-making at The National Roll & Foundry Company. • The inspector knows his job; he knows the rigid requiriments that every National roll must meet. • Such careful attention to details results in top quality and top performance in every National roll. Just try them and see.

NATIONAL ROLLS

National Rolls

THE NATIONAL ROLL & FOUNDRY CO.

AVONMORE, PENNSYLVANIA

SPECIALISTS IN IRON, ALLOY IRON AND STEEL ROLLS AND CASTINGS, STEEL ARMOR CASTINGS

WHY IT PAYS TO BUY STEEL FROM WAREHOUSE

You don't need to freeze money in inventory!

WHEN YOU BUY STEEL FROM WAREHOUSE, YOU GET:

- LOWER INVENTORY COSTS
- LOWER SPACE COSTS
- LOWER TIME COSTS
- LOWER CAPITAL INVESTMENT
- FASTER PRODUCTION
- FEWER INVENTORY LOSSES

LET your U. S. Steel Supply warehouse serve as your inventory stock. Then you eliminate from your overhead the cost of carrying your own inventory, and free a substantial portion of your capital for other purposes. U. S. Steel Supply can always deliver the steel you want to your plant or job site at the time you specify. Just tell your U. S. Steel Supply salesman what you want . . . when . . . and where.

U. S. STEEL SUPPLY

DIVISION

General Office
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USS

Warehouses and Sales Offices Coast to C

UNITED STATES STEEL

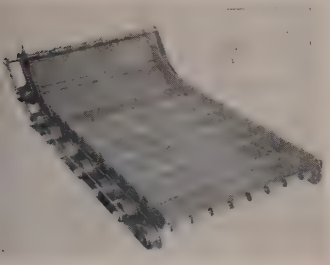
NEW PRODUCTS and equipment

Reply card on page 137 will bring you more information on any new products and equipment in this issue

edesigned Hinged Belt Link

. . greater stress distribution

Standard component links of the anufacturer's hinged steel belt e redesigned to incorporate four terlocking flanges on each side the link. This arrangement hieves greater distribution of ress on the belt, also allows links be staggered to eliminate later- movement between individual ks and minimize scrap fall- rough. In addition, the increased



ecision of link positioning pro- des slightly increased carrying pacity.

As before, all links are avail- le solid or with perforations that rmit drainage of coolants and her solutions. Belts are assem- ed from mass produced stocked mponents to form belting from 6 ches to almost any required dth and length. May-Fran En- neering Inc., Dept. ST, 1725 arkstone Rd., Cleveland 12, O.

R MORE DATA—CIRCLE REPLY CARD NO. 1

rease-Fitting Cover

. . neoprene bar to abrasives

Dirt and other abrasives can be pt from entering grease fittings use of this oil-resistant neo- ene cover, called Zur-Kap. It designed for use on all equip- ent using either Zerk or Alemite- pe fittings.

Easy to snap on and off, the caps also save time usually re-

quired to clean fittings before each lubrication. Winner Mfg. Co., Dept. ST, Box 945, Ft. Wayne 1, Ind.

FOR MORE DATA—CIRCLE REPLY CARD NO 2

Metallizing Machine

. . . no manual adjustment

This improved metallizing machine incorporates a nozzle that eliminates need for manual adjustment and assures even flow of metal to surface. Another improvement is construction of the gas

mixing chamber in the nozzle at the point of combustion, completely eliminating backfire.

All bearings for the wire feed mechanism are encased in the main body gear case casting to produce perfect alignment and enable simple repair, when necessary, by semi-skilled workmen on the spot. Vandersee Engineering Co. Inc., Dept. ST, 727 W. 7th St., Los Angeles, Calif.

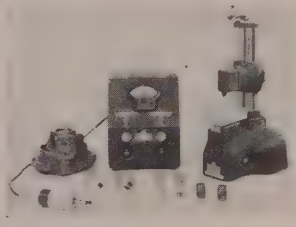
FOR MORE DATA—CIRCLE REPLY CARD NO. 3

Hand Gage and Comparator

. . . refines selective assembly

Electrolimit hand gage and external comparator are combined to form this radial internal clearance comparator. Designed to refine selective assembly, the gage shows actual clearance between parts being checked.

In operation, the comparator is handled easily. Hand gage measures cylinder inside diameter,



while piston outside diameter is checked on the external comparator. Meter in the cabinet indicates exact clearance between the two selected parts. Both gage and comparator are set to minimum and maximum masters. Meter has total 0.002-inch scale, with each graduation equal to 0.0001-inch. Pratt & Whitney, division Niles-Bement-Pond Co., Dept. ST, W. Hartford 1, Conn.

FOR MORE DATA—CIRCLE REPLY CARD NO. 4

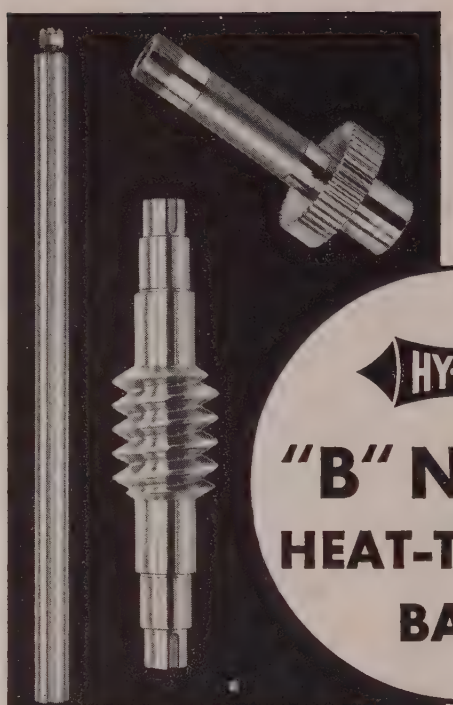
Two-Column Automatic

. . . processes 565 rods per hour

A two-column drilling, reaming and chamfering machine processes 565 connecting rods an hour at 100 per cent efficiency. It is arranged

OVER ONE HUNDRED YEARS OF CONTINUOUS SERVICE. ROUNDS, SQUARES, FLATS, HEXAGONS, OCTAGONS

BILLETS AND FORGINGS FOR PRODUCTION, TOOL ROOM AND MAINTENANCE REQUIREMENTS



HY-TEN

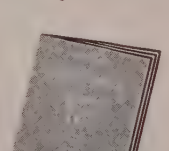
"B" No. 3X HEAT-TREATED BARS

This higher-priced alloy steel can save you money!

"B" No. 3X heat-treated bars offer many production economies, even though machined at about ¾ths the speed of annealed bars. They are supplied to your desired physical properties, and can be machined more easily than standard heat-treated bars with equivalent properties. The expense of scaling, distortion, straightening, and often grinding, are eliminated — as well as the cost of extra handling and heat treating of finished parts!

Although the cost is a little more than for ordinary annealed stock, a trial order will convince you of the true economy of HY-TEN "B" No. 3X heat-treated bars! Just call your nearest WL representative.

Write today for your FREE COPY of the Wheelock, Lovejoy Data Book, indicating your title and company identification. It contains complete technical information on grades, applications, physical properties, tests, heat treating, etc.



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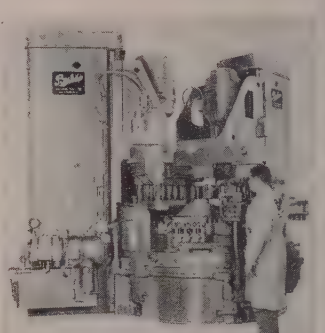
SANDERSON-NEWBOULD, LTD., MONTREAL

HY-TEN and AISI

131 Sidney St., Cambridge 39, Mass. and Cleveland • Chicago • Detroit Hillside, N. J. • Buffalo • Cincinnati

with tool-steel, laminated hardened and ground ways. A single operator loads the parts manually. Parts are clamped hydraulically and ejected automatically.

The eight-station holding fixture is mounted on a 60-inch diameter



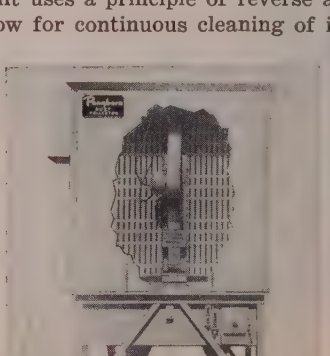
index table. Other features include automatic lubrication and the usual J.I.C. standards for all installations. Buhr Machine Tool Co., Dept. ST, Ann Arbor, Mich.

FOR MORE DATA—CIRCLE REPLY CARD NO. 5

Self-Cleaning Dust Collector

. . . employs reverse air flow

Type CH-3 self-cleaning cloth screen dust collector is designed to lower operating and maintenance costs by continuous automatic collection, constant air volume and suction, and positive reverse flow filter cleaning. The unit uses a principle of reverse air flow for continuous cleaning of its



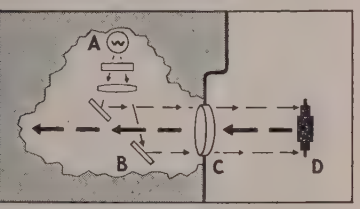
cloth filter. Because this self-cleaning collector operates continuously, there is no need for shutdown for mechanical cleaning of unit.

Standard sizes are furnished with six-screen-high construction. Also

Plain Pointers on Projection

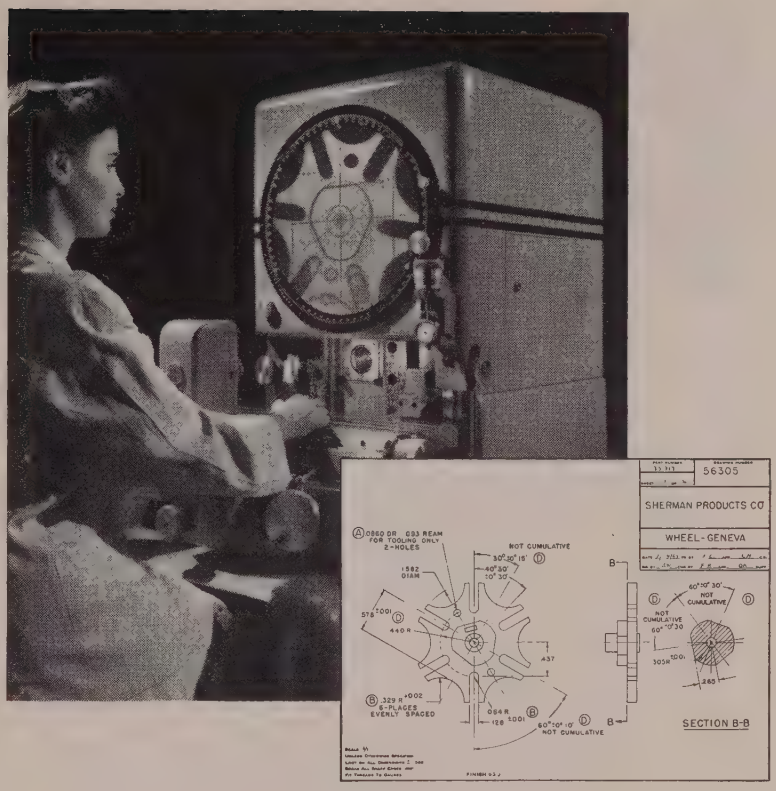
NE of the basic precepts of the study of ometrical optics is that the angle of in- dence equals the angle of reflection. This w, recognized by the Greek philosophers d refined by later investigators, has an portant bearing on modern optical gaging projection. In numerous instances it is sirable to project the surface of a part on e screen to check the position and size of cesses or to measure features which may ot permit conventional profile shadow im- es. The ease and success with which this done depend not so much on how much ht is thrown on the part as on how much this light is reflected back into the in- ument's lens.

Traditionally, surface illuminators used th contour projectors have been placed at angle on each side of the lens or optical is. This was true of the pilot model of the odak Contour Projector and we frankly mit it proved somewhat less than perfect. nce the light struck the part at an acute gle, it was reflected from the surface at a nilar angle—reflected away from the lens, it were, when the part was normal to the ns for a distortion-free image.



However, between design of this pilot odel and our production models, our op- al engineers devised a radically different stem. As shown here schematically, this nsists of a 1000-watt lamp (A) so mounted at its light is reflected by a mirror (B) rough the front lens (C) of the instrument. nce the light from this surface illuminator avels along the axis of the lens, it is re- cted from a part (D) back through the ns with negligible loss. By staging the part be measured perpendicular to the optical is, the angles of incidence and reflection pproach zero degrees. Light is reflected om the part back on its own path.

This permits inspection of deep recesses d results in a screen image of unusual illiance when projecting surfaces. The lat- we have frequently demonstrated by acing the works of a small watch on our ntour projector. Spectators are generally pressed to see the wheels and gears in mo- on, and on at least one occasion we've had watch brought to us for repair. While this as perhaps somewhat embarassing, we're conciled by the thought that users of our ojectors are saved embarrassment daily cause of the accuracy with which they can ge parts to "tenths."



Inspection costs fall when surface features and profiles are checked simultaneously

YOU may be missing a chance to lower inspection costs, speed the work, if you're overlooking the surface illumination feature of the Kodak Contour Projector.

Take the Geneva wheel shown here. By optical gaging, 47 dimensions are checked to tolerances of .001″ in *less than 60 seconds,* using a single chart-gage and a simple staging fixture. Conventional shadow projection is used to check 36 of these. But only through surface projection can the 11 dimensions of the hub, including five angles and three radii, be checked simultaneously. A flick of a switch and the unique, self-contained surface illuminator (described in the column at the left) makes checking surface details as easy as measuring shadow profile.

The inherent speed and accuracy of inspection and measurement on Kodak Contour Projectors are lowering inspection costs on all sorts of parts, simple and complex, large and small. The field representative in your area will be glad to show you how optical gaging can work for you. To get in touch with him, or for a copy of a booklet, "Kodak Contour Projector," write to:

Special Products Sales Division
EASTMAN KODAK COMPANY
Rochester 4, N. Y.

the KODAK CONTOUR PROJECTOR

Optical Gaging

A new sound movie, Optical Gaging, shows how to simplify complex inspection problems. We'll tell you how to get it for a showing.

Kodak
TRADE-MARK

has
coil-itis
got you
constantly
doctoring
your
tanks?

Like the human appendix, pipe coils often give constant trouble until they are removed and replaced with Platecoils. Immediately, you will notice the difference as Platecoils put new life and profits into your heat transfer processes. They heat or cool 50% faster. They take 50% less space in the tank leaving room for greater payload. Platecoils overcome the limitations and operating difficulties of old fashioned and outmoded pipe coils to save hours of downtime.

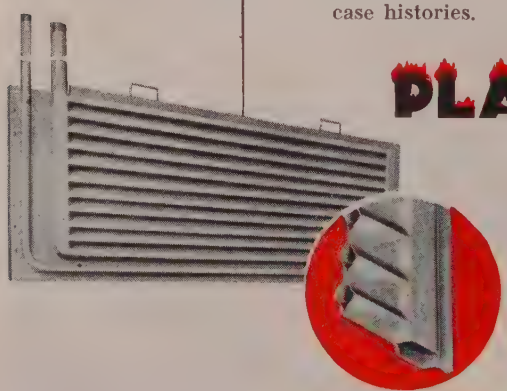
It costs less to cure coil-itis with Platecoils than to suffer its evils.

Write for Bulletin P72 today!

PLATECOILS SAVE 50% IN HEAT TRANSFER COSTS

PLATECOILS REQUIRE 90% LESS CLEANING

At Motor Wheel Corporation cleaning time has been cut from 10 hours per pipe coil every 60 days to only one hour per Platecoil. Ask about other case histories.



PLATECOIL

REPLACES PIPE COILS

Coil-itis — Diagnosed as tank heating and cooling problems. Platecoils — the prescription for solving pipe coil problems.

PLATECOIL DIVISION, TRANTER MANUFACTURING, inc., LANSING 4, MICHIGAN

NEW PRODUCTS and equipment

available for smaller volume pro lems are four and five-screen-hig by 5-foot-long screen section Existing installations can be co verted to the self-cleaning arrang ment by removal of the mechanic rapping mechanism, replacemer of grid wall and slight alteratio to screen frames and clamping d vices. Pangborn Corp. Dept. S Hagerstown, Md.

FOR MORE DATA—CIRCLE REPLY CARD NO. 6

Tempering, Flattening Furnace

. . . completely self-contained

This tempering and flattenin furnace has three sections of pre sure plates or dies and three door one for each section. Valves fo opening and closing the dies ar immediately above the center doo and cylinders are located on to behind the flat plates.

When cylinders are raised, die provide ten openings for insertio

of flat pieces that are to be flat tened and tempered. Burner an control valve are in back of th furnace. Waltz Furnace Co., Dept ST, 1901 Symmes St., Dept. 9 Cincinnati, O.

FOR MORE DATA—CIRCLE REPLY CARD NO. 7

Amplifying Gage

. . . optical-mechanical design

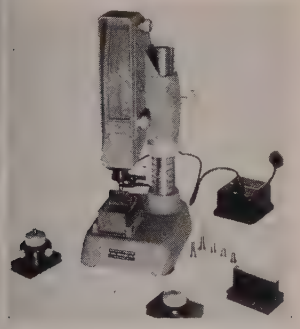
Amplifying gage, the Leitz Opti Comparitol, combines optical an mechanical principles. A beam o light from a low voltage lamp pro

USE A REPLY CARD

Just circle the corresponding number of any item in this section for more information.

s an index mark against tilting
ror with a fulcrum that gives
) 1 initial magnification to the
tact tip. Index mark is re-
ted against a first surface mir-
that redirects the beam of light
the index mark against a long
nslucent screen. Result: Total
olification on the scale of 1000
l.

)ial is graduated in 0.00005-inch
has range of 0.005-inch. With



single gage block, or master
ce, any size varying 2½ thou-
dths plus or minus, in one-half
ths can be set up to eliminate
nplicated master combinations.
)rge Scherr Co. Inc., Dept. ST,
Lafayette St., New York 12,
Y.

MORE DATA—CIRCLE REPLY CARD NO. 8

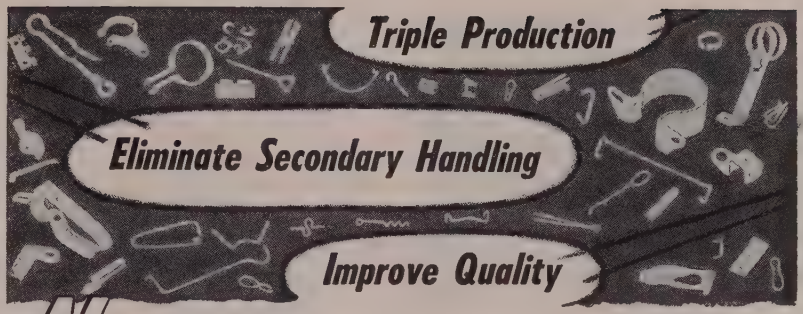
gle-Test Plating Check

. hangs like regular work

Manufacturers with plating de-
rtments and electroplating
nts can get a picture of actual
duction in one test with this
nging Cell unit. Checked are
h composition, plating range,
owing power, optimum agita-
n, proper cleaning and current
ribution.

The cell is suspended on a cath-
busbar—just like a rack of
rk — enabling frequent spot
cking with little time and no
rt. Minor bath corrections can

USE A
REPLY CARD
Just circle the corresponding number of any item in this section for more information.



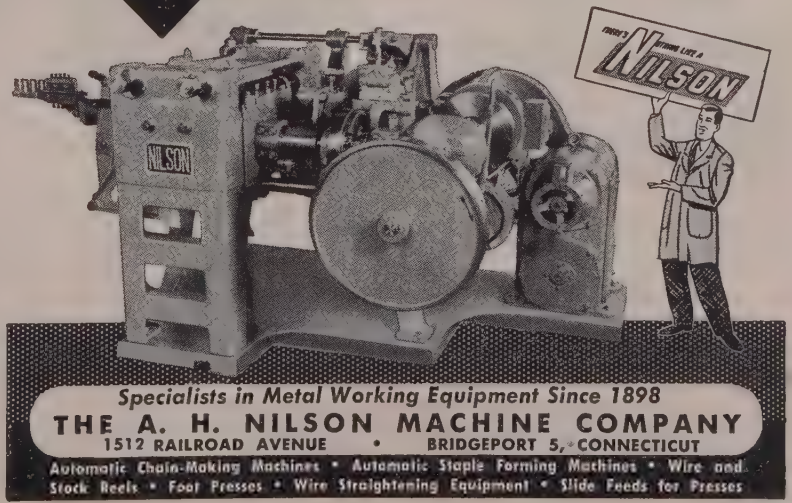
NILSON
4-SLIDE
Wire and Ribbon Metal FORMING MACHINES

. . . . for more efficient production of wire forms and small metal stampings requiring swaging, piercing, stamping, blanking or coining and forming.

The NILSON S-F series and Heavy Duty Toggle Machines (shown below) feature a Horizontal Press in Combination with Four Forming Slides . . . . a combination that provides maximum tooling flexibility — lower die costs with shorter set-up time.

NILSON FORMING MACHINES available in a wide range of sizes to form wire 1/32″ to ½″ diameters and up to 3½″ wide ribbon stock.

For specific recommendations, send prints or samples of your operation, when requesting bulletin.



Specialists in Metal Working Equipment Since 1898
THE A. H. NILSON MACHINE COMPANY
1512 RAILROAD AVENUE • BRIDGEPORT 5, CONNECTICUT
Automatic Chain-Making Machines • Automatic Staple Forming Machines • Wire and Stock Reels • Foot Presses • Wire Straightening Equipment • Slide Feeds for Presses

STANDARD STOCK SIZE JOHNSON sleeve BEARINGS FROM YOUR LOCAL

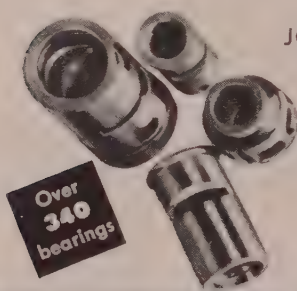
Johnson Distributor

JOHNSON GP BEARINGS

These GP (General Purpose) Cast Bronze Bearings run from ¼" to 4½" ID, 213 ID-OD combinations, up to 21 lengths of a given size.

JOHNSON LEDALOYL BEARINGS

Powder Metallurgy Ledaloyl Self Lubricating bearings in plain, flanged and self-aligning types.



JOHNSON EM BEARINGS

Electric Motor EM Bearings are available for all popular motors. Equal to or better than original bearings.

JOHNSON UNIVERSAL BRONZE BARS

Cored, solid and hexagon bars, 13 inches long. All except hexagon bars completely machined ID, OD and ends.

JOHNSON JB BEARINGS
Sleeve-Type

BABBITT METAL

Tin base and lead-base Babbitt in 7 pound bars.

Over 200 sizes

JOHNSON GRAPHITED BEARINGS

Cast Bronze Graphited Bearings provide 40 to 45% graphite contact with shaft, for applications difficult to lubricate, or where ordinary lubricants may damage goods in process.

Write for catalog

JOHNSON BRONZE COMPANY • • • 550 South Mill St., New Castle, Pa.

be made immediately. It is ada table to any type of still or aut matic plating. R. O. Hull Co. In Dept. ST, 1304 Parsons Ct., Roc River 16, O.

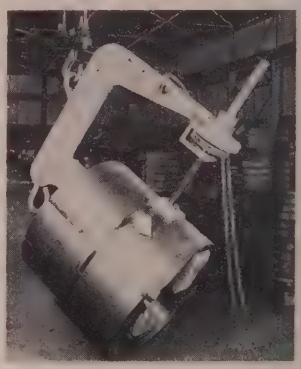
FOR MORE DATA—CIRCLE REPLY CARD NO. 9

Coil Handler

. . . lifts, turns 15,000-pounder

This coil handler lifts and tur coils up to 48 inches wide, at 1 000 pounds capacity. After t unit is placed on the coil, a pr sure shoe is adjusted to the c radial thickness. Shoe has floating action to allow full bea ing on the outer coil diameter.

Inner support arm has a co tour surface 4½ inches wide, t full length of the arm. This d tributes load over a greater ar to eliminate handling marks



even heaviest coils. A bale is l cated for straight lift with ho zontal axis to coil. Second ba turns the coil 90 degrees from ve tical or horizontal; a third pr vides for straight lift with vertic axis to coil. Dixon Automat Tool Inc., Dept. ST, 2304 23rd Av Rockford, Ill.

FOR MORE DATA—CIRCLE REPLY CARD NO. 10

Flameproofing Fabric Chemical

. . . impervious for cloth life

Special chemical process th renders work clothing impervio to flame for life of fabric is una fected by repeated washings dry-cleanings. The process, Pe maproof 300, is approved for wo clothes in steel mills by York R search Corp. of Connecticut aft tests based on ASTM Tentati Specifications D-626-41T. Treesda Laboratories & Textile Processi

Pressure Processing

. . . whoever uses it in their production is a customer or potential customer of **H-P-M**

DRAW . . . TRIM . . . PIERCE . . . and FLANGE in ONE OPERATION on this H-P-M!

That's the way Dura Steel Products Co., Los Angeles, handles the high-speed production of medicine cabinet bodies on their versatile 300-ton All-Hydraulic H-P-M, equipped with a two die set-up. One die draws the 16" x 26" cabinet body to a depth of 4-1/8" while the other die simultaneously handles the flange, pierce and trim operations. The press shows great versatility in handling many of the intricate jobs which are accepted from government agencies and other manufacturers.

No matter how simple or complex your pressure processing job may be . . . it's a good idea to plan it with the help of an H-P-M engineer.

HPM

THE HYDRAULIC PRESS MFG. CO.

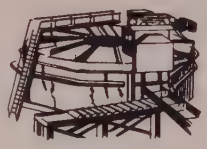
1044 Marion Road, Mount Gilead, Ohio, U. S. A.

Presses for Every Pressure Processing Application

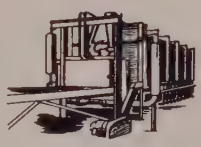
GASMACO INDUSTRIAL FURNACES

OIL OR GAS FIRED FOR ALL TYPES OF HEAT TREATING

GASMACO furnaces are designed for long, trouble-free service on a wide range of applications. Equipped to handle material of nearly any size or shape, they are ideally suited for forging, heat treating, spheroidizing and annealing.



Exclusive features of GASMACO furnaces are Silicon Carbide Tubes and Rollers which permit operating temperatures up to 2500° F., with fewer replacements. Complete control of the furnace atmosphere is maintained. Annealing is accomplished without decarburization or scale in simple, inexpensive car, pusher, conveyor, chain or roller hearth type furnaces.



All GASMACO furnaces are individually designed to fit your particular furnace requirements and to assure maximum operating economy. It will pay you to investigate these furnaces for your next heat treating job.

SALES REPRESENTATIVES

LEWIS C. BAXTER
2207 Ashland Avenue
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The Noble Equip. Co.
P.O. Box 39 • LaGrange, Ohio

KLIKA-STRIEBEL CO.
53 West Jackson, Rm. 1040
Chicago 4, Illinois

CHRISTY FIREBRICK CO.
506 Olive Street
St. Louis 1, Missouri

THE GAS MACHINERY COMPANY
16116 WATERLOO ROAD
CLEVELAND 10, OHIO

Designers • Fabricators • Erectors
Gas Plant Equipment and Industrial Furnaces
THE GAS MACHINERY CO. (Canada), Ltd.
HAMILTON, ONTARIO

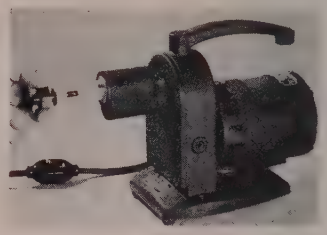
Co., Dept. ST, Benedum Tree Bldg., Pittsburgh, Pa.

FOR MORE DATA—CIRCLE REPLY CARD NO. 11

Power Thread Gaging Unit

. . . brings speed to bench work

Bench model Rotocheck power thread gaging unit is an electrically-operated gage for checking internal threads by power instead of manual rotation. Model's gaging



assembly is mounted directly on the motor, especially designed for bench inspection. Transfer of the entire unit from one location to another is facilitated by its lightweight construction and made convenient by a handle placed directly above the motor.

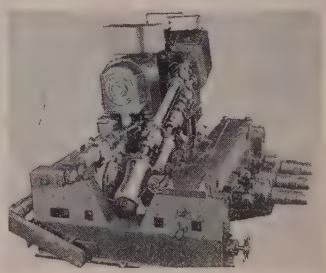
Gaging member screws into the part automatically at four revolutions per second. Reversal of applied pressure causes immediate disengagement or drive reversal, as desired. Taft-Peirce Mfg. Co., Dept. ST, Woonsocket, R. I.

FOR MORE DATA—CIRCLE REPLY CARD NO. 12

Heavy-Duty Straightener

. . . speed to 320 fpm on bars

This straightening machine is built specifically for heavy-duty work on hod-rolled bars and heavy-



walled tubes. The unit is equally adaptable for steel and nonferrous tubes and round bars.

Tubes from 1 to 10 inches OD and bars from 1 to 6½ inches diam-

THIS **63-lb.** 4150 STEEL BLANK

reduced to

THIS **18-lb.** SEMI-FINISHED COLLET

...in 13 minutes

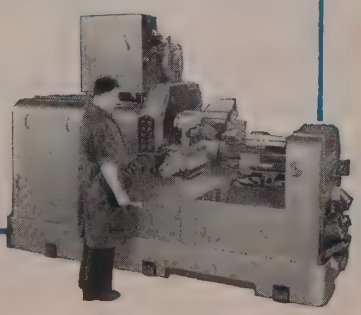
ON THE NEW **12" MC-UNIVERSAL**

ACME-GRIDLEY

Single Spindle Automatic Chucker

FEATURES

- Six spindle speeds and three feed ranges, *all automatically selective* for each combination of change gears. Spindle speeds range from 25 to 1478 RPM.
- Five end working tool slides and two side slides each independently cammed. Turret indexing located in rugged outer turret support and driven by separate motor independent of cross slide operation.
- Open type tooling zone, large chip area, minimum change of cams. Interchangeable spindle speed and feed change gears—all contribute to quick change-over from job to job.
- Work cycle automatically controlled—no time loss between loading and unloading work piece.
- Strength to sustain close tolerance at the fastest feeds and highest speeds modern carbide cutting tools and hardened steel cams can take.
- Compact, accessible and free from complications — one man runs 2 or more machines.



The floor to floor time on this particular job is *5 times faster* than the previous method employed.

The job is typical. If savings like this—in man hours—in floor space, overhead—*total costs per job*—are important in your chucking work, why not ask us to help you make similar comparisons—get the facts.

Complete catalog, MC-53

You can't do TODAY'S job with YESTERDAY'S tools—and be in business TOMORROW.

The NATIONAL ACME COMPANY

1101 EAST 131st STREET • CLEVELAND 8, OHIO

Acme-Gridley Bar and Chucking Automatics, 1-4-6 and 8 Spindle —Hydraulic Thread Rolling Machines—Automatic Threading Dies and Taps—Limit, Motor Starter and Control Station Switches—Solenoids—Contract Manufacturing.

"PRESTALLOY"
DIAMOND DRESSERS
FOR INDUSTRY

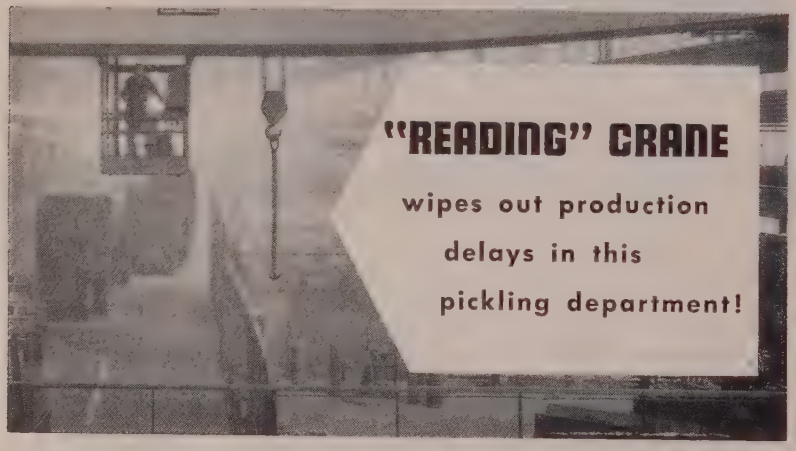
The "Prestalloy" process assures greater diamond utility at the lowest possible production cost per dollar investment . . . Write us for complete information or send for our complete catalog.

SEND FOR CATALOG

AGENTS: Some exclusive Territories now open.

DIAMOND PRODUCTS, INC.

Pioneering in Diamond Impregnated Products since 1932.
329 Prospect Avenue, Elyria, Ohio



A prominent producer of automobile frames found production slipping. Figuring it was due to inefficient load handling equipment in his pickling room, he called in a "Reading" handling engineer.

After installing a 10-ton "Reading" overhead traveling crane he found his problem solved. Now the operator simply pushes a button. The motorized crane, traveling 400 feet per minute, does all the work. Employee morale is higher because fatigue is eliminated. And the extra efficiency obtained resulted in improved production.

Further information on "Reading" Electric Cranes will enable you to judge their advantages for your own load handling operations. Get our latest 16-page bulletin, "The *Why* and *How* of Faster Production. Write to:

READING CRANE & HOIST CORP. • 2102 ADAMS STREET, READING, PA.

Chain Hoists
Electric Hoists
Overhead
Traveling
Cranes

READING CRANES

NEW PRODUCTS and equipment

eter can be straightened at spee up to 320 fpm. Any 4 to 1 rat such as 50 to 200, 70 to 280 or to 320 fpm can be furnished, d pending on requirements of t particular application. Machi employs its manufacturer's fiv roll principle of straightening, which a central pressure roll located between two sets of o posed rolls, each having one driv and one idler roll. Sutton Eng neering Co., Dept. ST, Bellefont Pa.

FOR MORE DATA—CIRCLE REPLY CARD NO. 13

Nonmetallic Rust Inhibitor

. . . developed as oil additive

Rust inhibiting oil additive is sorbitan mono fatty acid ester, d veloped for protecting ferrous su faces. It is shipped as a concen trate for addition by refiner compounder to his oil.

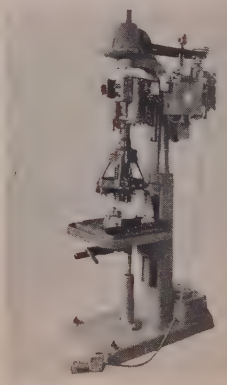
Immediate indicated uses includ protection of stored aircraft, dies and gasoline engines, turbine pipe lines and ferrous tools components in production stage In internal combustion engine particularly, the material provide freedom from preignition an other undesirable effects of ash residue. Atlas Powder Co., Dep ST, Wilmington, Del.

FOR MORE DATA—CIRCLE REPLY CARD NO. 14

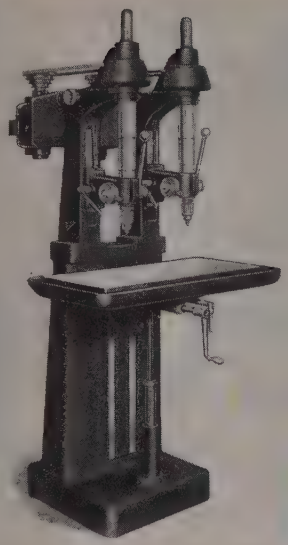
Drilling and Tapping Machines

. . . electric air-powered thrust

This line of heavy-duty drillin and tapping machines is equippe with electrically-controlled-air-pow



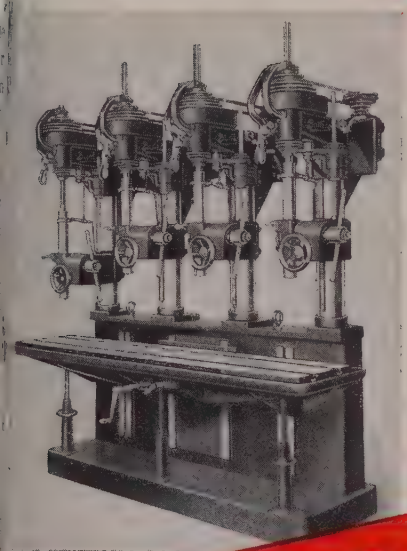
ered thrust. Two models are pro duced: Model C-16 air thrus



"Buffalo" BUILDS the DRILL that can cut your

- REJECTS
- WASTE MOTION
- FATIGUE

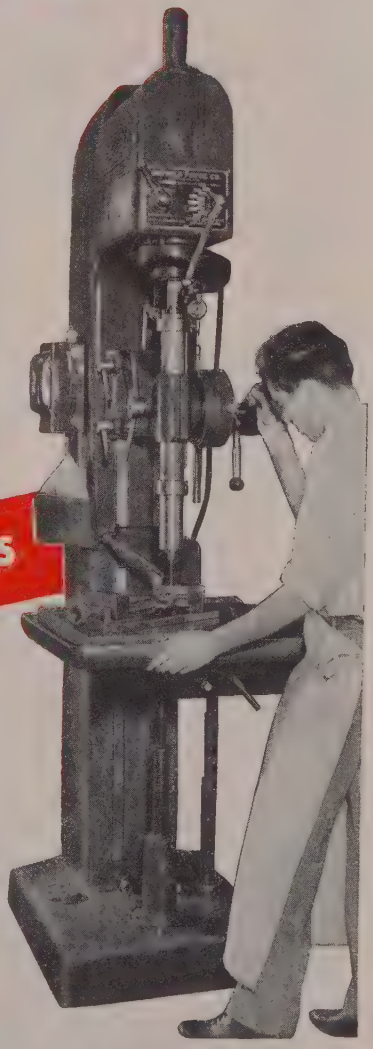
. . . IN THE TOOL ROOM . . . OR "ON THE LINE"



You can pick a "Buffalo" Drill matched to the exact drilling, tapping or reaming jobs you do, and get a real saving in time and costs. At left is one example— the "Buffalo" No. 14 High Speed Sensitive Drill for accurate work on precision parts using drills up to ½".

Seven other models, up to 2" capacity in cast iron, are available. All controls are placed for almost effortless operation. Speed changes and table or head raising or lowering are all done rapidly.

For JOB DRILLING or "MARATHON" RUNS



Whether you need a machine for odd-job drilling, tool room work or long production runs, "Buffalo" builds it. At right is the famous "RPMster", the drill with 1001 speeds instantly changed. At left is the big, rugged "22" that's as easy to handle as small sensitive drills. As a first step towards getting *your* drilling costs down, why not write us for recommendations on your problem? Thousands of plants have benefitted by doing this.

"Buffalo" MACHINE TOOLS

BUFFALO FORGE COMPANY

158 MORTIMER STREET BUFFALO, NEW YORK

Canadian Blower & Forge Co, Ltd., Kitchener, Ont.

DRILLING PUNCHING CUTTING SHEARING BENDING

Bale It the G-H Way...

Make Sheet Metal Salvaging a Profitable Operation in Your Plant

Wherever sheet metal scrap accumulates in volume, it presents two problems: *First* — neat, orderly disposal with minimum disturbance to plant operation. *Second* — profitable salvaging.

A well integrated scrap salvaging operation, built around the right size and type of baling equipment, can solve *both problems* for you just as it has for many others.

The Galland-Henning Hydraulic Baling Press is fast, powerful and rugged . . . designed and constructed to convert stampings, clippings and other loose scrap into dense, compact bales at lowest possible cost per ton . . . bales that always command premium prices on the scrap metal market.

If you need help in planning Profitable Salvaging of your sheet metal scrap, you can rely on Galland-Henning for competent counsel based on years of successful experience in the design, construction and installation of scrap metal balers.

GALLAND-HENNING MFG. CO.
2747 SOUTH 31ST STREET • MILWAUKEE 46, WISCONSIN

GALLAND-HENNING

SCRAP METAL BALING PRESSE

illing machine and model C-16-T thrust drilling and tapping machine. Both are available as box column, floor-stand type, with sliding head and adjustable worktable, used as bench and table multiple unit combinations. The latter can have two, three or four head units. Model C-16-T puts relatively short-run jobs on a high production basis because of its ability to drill parts and tap them from the same fixture. Maximum 980-pound thrust at 100 psi is obtainable on both models; length of stroke is 4 inches. Beckett-Harper Co. Inc., Dept. ST, Wilmington, O.

FOR MORE DATA—CIRCLE REPLY CARD NO. 15

Slide rule Pencil

. . . calculates, magnifies, writes

This slide rule pencil calculates, magnifies and writes in two colors. Among the ten functions it combines in one instrument are collapsing measuring scale, a fine print magnifier, depth gage, detachable

drilling edge, plain and enlarging cursor for the slide rule's nine scales.

The device is only 6¼ inches long, weighs less than 1 ounce and is carried easily by pocket-clip. Device Development Co., Dept. ST, 26 W. Fourth St., New York 14, N. Y.

FOR MORE DATA—CIRCLE REPLY CARD NO. 16

Pocket-Size Tap Selector

. . . also notes drill, lubricant

A convenient pocket-size slide chart brings basic tap information to the user's fingertips; makes it easy to select and specify correct drill and lubricant as well as proper tap for each job.

Information for both fractional and machine screw size taps includes recommended drill size with decimal equivalent; recommendations for various classes of fit; major pitch and root diameters;

Ready-Power offers 4 important advantages

OVER ALL OTHER GAS-ELECTRIC DRIVES

1—ONLY READY-POWER CAN BE QUICKLY CHANGED. A spare can be installed in 5 minutes!

2—ONLY READY-POWER CAN BE SHIFTED FROM ONE TRUCK TO ANOTHER, permitting standardization of power.

3—ONLY WITH READY-POWER CAN YOUR TRUCKS BE KEPT WORKING with a quick change of power units.

4—ONLY READY-POWER OPERATES AT THE LOW ENGINE SPEED that results in long life and low maintenance.

Remember . . . your truck is no better than its power. It PAYS to convert present electric trucks to Ready-Power . . . and it PAYS to specify Ready-Power when buying new trucks.

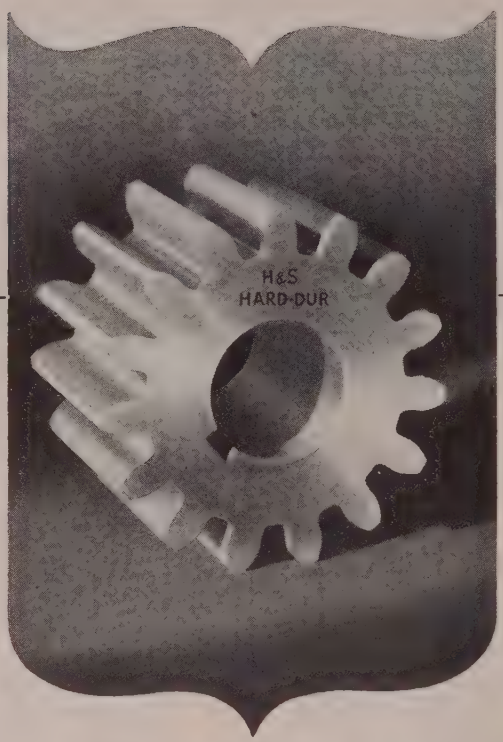
CONTINUOUS-DUTY POWER UNITS

The READY-POWER Co.

3824 Grand River Ave., Detroit 8, Michigan

Manufacturers of Gas and Diesel Engine-Driven Generators and Air Conditioning Units; Gas and Diesel-Electric Power Units for Industrial Trucks

when the job is tough . . .



USE "HARD-DUR" GEARS

they preserve the tooth form

• "HARD-DUR" Gears not only preserve tooth form because the material is highly wear resistant and the gears are scientifically heat treated to obtain maximum physical properties...but they have involute teeth that are produced to high standards of accuracy by very careful workmanship. In fact "HARD-DUR" Gears are so much stronger, harder and more wear-resistant, that they are guaranteed to have at least four or five times the life of similar untreated gears...and at only 50% extra in cost.

THE HORSBURGH & SCOTT CO.
GEARS AND SPEED REDUCERS
5112 HAMILTON AVE. • CLEVELAND 14, OHIO, U.S.A.

Send note on Company Letterhead for 488-Page Catalog 49

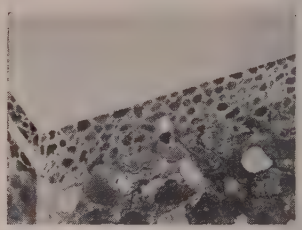
and tap limits for various grind Selectors are offered witho charge by the manufacture Threadwell Tap & Die Co., Dep ST, Greenfield, Mass.

FOR MORE DATA—CIRCLE REPLY CARD NO. 17

Heat-Resistant Flooring

. . . withstands 2000° F

Designed for use for tempera tures ranging to 2000°F, this hea resistant flooring withstands ther mal shock and does not deteriorat under extremely high temperatur



It disperses heat rapidly through aluminum rods embedded about inch below the surface. These rod carry heat from the contact are and spread it over a wide floo section.

Floor is ready for use 24 hour after installation. Flash-Stone Co Inc., Dept. ST, Philadelphia, Pa.

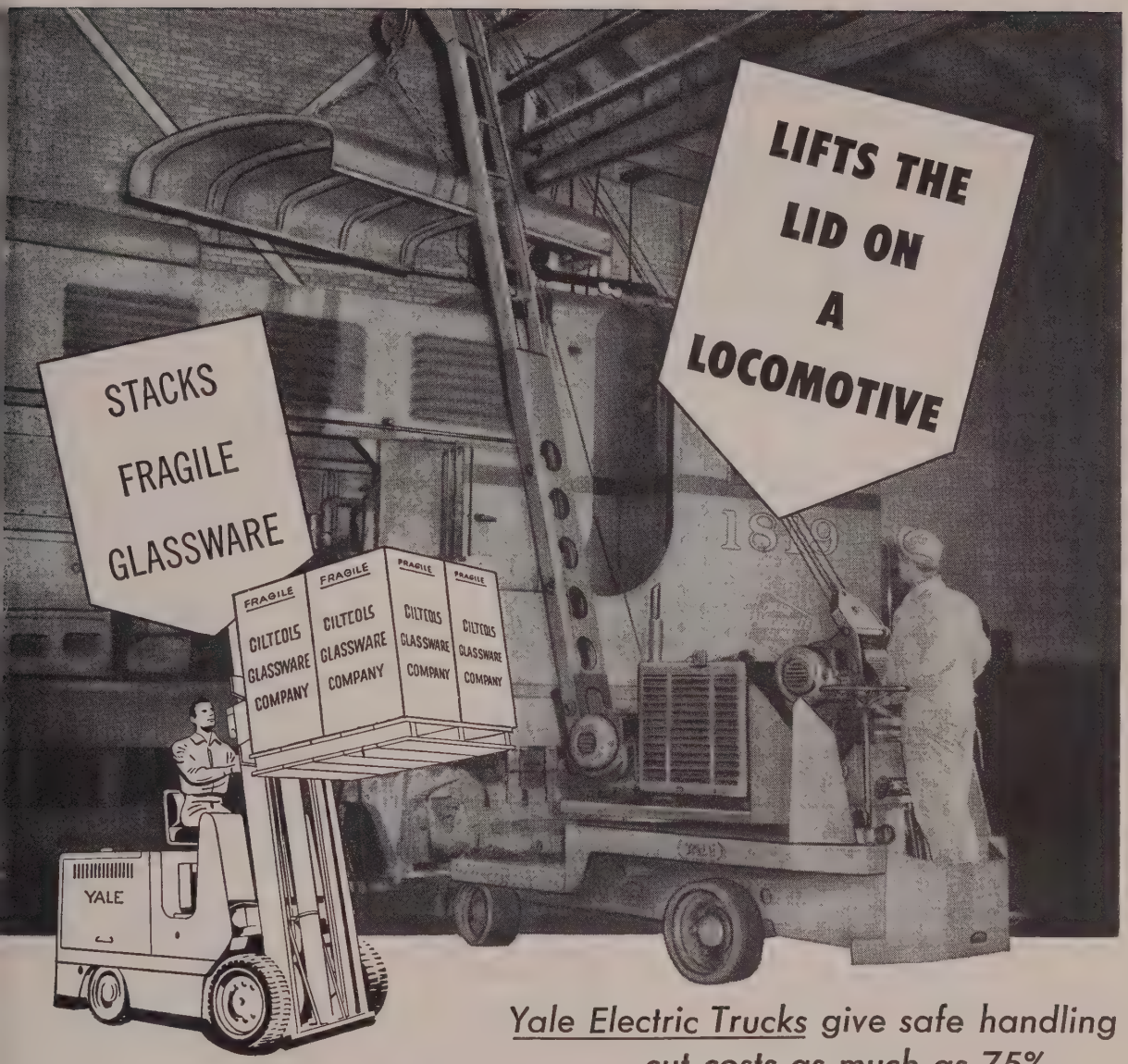
FOR MORE DATA—CIRCLE REPLY CARD NO. 18

Thermal Insulating Material

. . . sprayed like paint on metal

A quick-drying material can b sprayed like paint on metal, mak ing treated surface capable of with standing temperatures as high as 5000° F. Called Pyrolock, a 1/16- inch coat of the insulation protects metal as long as 10 seconds against flame temperatures hotter than the

melting point of the metal. It is water-base inorganic material, non- toxic, nonflammable, nonexplosive and will adhere directly to clean



Yale Electric Trucks give safe handling ... cut costs as much as 75%

DIFFERENT LOADS call for different equipment—and the comprehensive YALE line offers exactly the truck your job requires, whatever your business may be.

To keep down maintenance costs and assure 24-hour service, YALE Trucks offer such special features as: Hypoid Gears, Involute Spline Drive Shafts, and Yale Lift Channels. As a result, YALE users report unusual savings —with handling costs often reduced as much as 75%.

Choose the truck you need from YALE's wide variety of models, including Gas, Diesel, LP-Gas, Gas-Electric, and Electric in capacities up to 100,000 lbs. Attachments available for specialized handling jobs.

YALE*

MATERIALS HANDLING EQUIPMENT

*Registered in U. S. Patent Office

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The YALE & TOWNE Manufacturing Co., Dept. 89
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Please send my free copy of *Picture story of Yale Materials Handling Equipment.*

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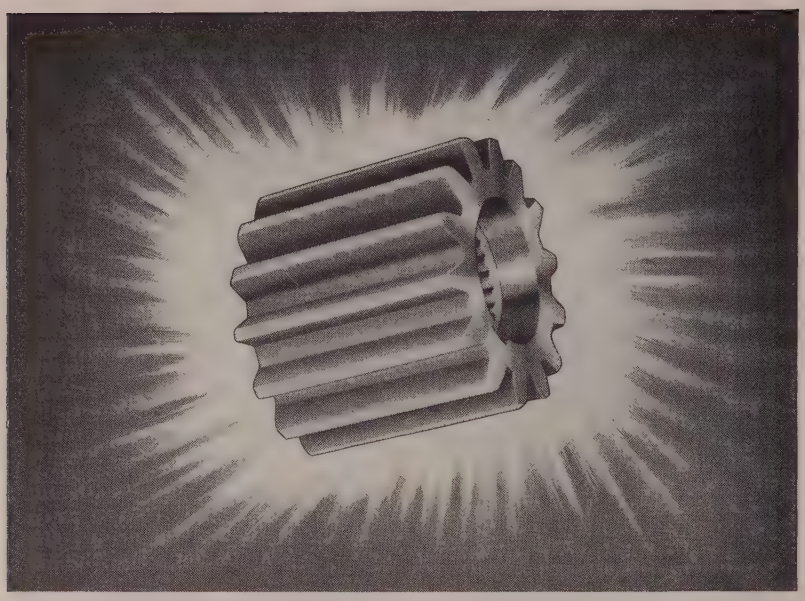
In Canada write: The Yale & Towne Mfg. Co., St. Catharines, Ontario, Canada

Gas, Electric, Diesel Lift Trucks • *Worksavers* • Hand Trucks • Hand and Electric Hoists • Pul-Lifts



This Pittsburgh Purple ARMORED Gear might save you a good many dollars

Increasing gear life may be a real problem for you but it's our business. It is something we do by combining design, metal, and machining with a special heat-treating process and experience we have gained making quality gears since 1914.

The PITTSBURGH Armoring process puts the right hardness in the right places. It makes the wearing surfaces hard but leaves the core tough and shock-resistant. **Armored Gears** are so good that we guarantee them to give you longer service.

By changing to PITTSBURGH **Armored Gears** in a product you make, or on a machine you use, you might save a good many dollars. Our engineers will gladly consult with yours to work out a solution. Write us today for prompt attention.

Look for the "**Pittsburgh Purple**" protective coating on the gears you buy.

SPUR
MITRE
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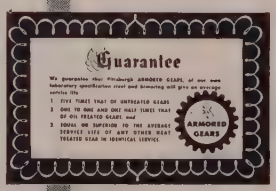
HERRINGBONE
WORM GEARS
REDUCERS
CRANE WHEELS

Your Guarantee of Longer Life



PITTSBURGH GEAR COMPANY
27th & Smallman Streets
Pittsburgh 22, Pa.
Phone: ATlantic 1-9950

subsidiary of BRAD FOOTE GEAR WORKS, INC. • CICERO 50, ILLINOIS

metal surfaces without sandblasting or use of priming surface preparations.

Resistant to most solvents and chemicals, the material withstands indefinitely temperature cycles of minus 60° F to plus 165° F. B. F. Goodrich Co., Dept. ST, Akron, O.

FOR MORE DATA—CIRCLE REPLY CARD NO. 19

Replaceable Vise Jaws

. . . reversible design ups life

Complete variety of replaceable vise jaws, available for the manufacturer's vises, includes hard steel members with diamond serrations. These can be replaced with smooth jaws of hard or soft steel. Smooth brass or copper, nonmagnetic and

nonsparking are also available, as are plastic fiber jaws designed for delicate work surfaces.

All jaws are easily removable and interchangeable. Since most jaws wear first on top surface, reversible characteristic acts to extend jaw life considerably. Wilton Tool Mfg. Co., Dept. ST, 925 Wrightwood Ave., Chicago 14, Ill.

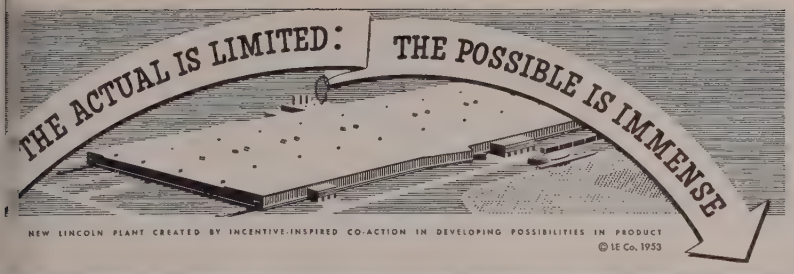
FOR MORE DATA—CIRCLE REPLY CARD NO. 20

Aluminum Felt-Back Flashing

. . . withstands chemical actions

Improved waterproofing product for building and maintenance, Epal aluminum flashing is reported to be noncorrosive, withstanding any chemical action of acids, alkali or salt spray in normal use.

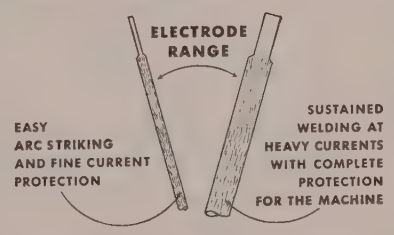
Some of its qualities: Epoxydized aluminum to gain corrosion resistance; felt-backing that permits easy application to all masonry and wood surfaces. The latter's insoluble bond is not affected when applied with cut-back asphalt. The flashing is crimped for expansion and contraction, retaining flexibility in extreme heat or cold.


THE ACTUAL IS LIMITED: THE POSSIBLE IS IMMENSE
NEW LINCOLN PLANT CREATED BY INCENTIVE-INSPIRED CO-ACTION IN DEVELOPING POSSIBILITIES IN PRODUCT
© LE Co. 1953

TODAY'S MOST ADVANCED AC WELDER.
"Fleetwelder", available in
300, 400, and 500 amp sizes, gives you

EXTRA RANGE TO SAVE EXTRA DOLLARS on light and heavy work

LOOK at the sketch. It shows *how* you benefit through "Fleetwelder's" wide current range in which maximum welding currents are 15 times minimum current values.


ELECTRODE RANGE
EASY ARC STRIKING AND FINE CURRENT PROTECTION
SUSTAINED WELDING AT HEAVY CURRENTS WITH COMPLETE PROTECTION FOR THE MACHINE

This *extra range* teamed with "Fleetwelder's" exclusive "Arc-Booster" ensures fine currents *with instant arc striking* for light gauge jobs while with the same welder you have ample amps for sustained welding at high currents.

No other AC welder offers this cost cutting combination . . . and at such low cost.

INVESTIGATE "FLEETWELDER" TODAY— See what new advancements in faster, more efficient welding are being put to use by Lincoln to simplify and speed your operations and cut your welding costs.

SEND FOR FREE BULLETIN 1314 *on "Fleetwelder". Available by writing on your letterhead to Dept. 1609*

THE LINCOLN ELECTRIC COMPANY
CLEVELAND 17, OHIO
THE WORLD'S LARGEST MANUFACTURER OF ARC WELDING EQUIPMENT

11 WAYS to cut AC welding costs

DESIGNED for faster, simpler, more efficient welding, Lincoln's "Fleetwelder" saves money on every AC job. Here's how:

1. SELLS FOR LESS—Built with Lincoln incentive production methods, "Fleetwelders" low selling price gives *more range, longer service, easier, faster operation, greater dependability* for the dollar . . . to cut your AC welding costs.

2. Complete Overload Protection—Built with *generous* reserve capacity for long sustained output at high currents, "Fleetwelder" is *completely protected* against damage due to overheating *by a thermostatic controlled magnetic starter* . . . a feature exclusive with Lincoln.

3. Exclusive "Arc-Booster"—Pioneered by Lincoln, the exclusive "Arc-Booster" blasts the end of the electrode with extra amps for an instant when the electrode touches the work to start the arc automatically. Ideal in out-of-position welding.

4. Completely Safe—No high frequency devices as on some welders to help arc starting. Open circuit voltage is only 71 volts. Output terminal panel recessed to eliminate accidental shorting of leads.

5. "Low Voltage" Safety Relays available for special work. (Optional extra.)

6. Takes Less Power—"Fleetwelder" draws less amps in idle current than required for other AC welders. Inbuilt power factor is higher. Has pilot light to indicate power is on.

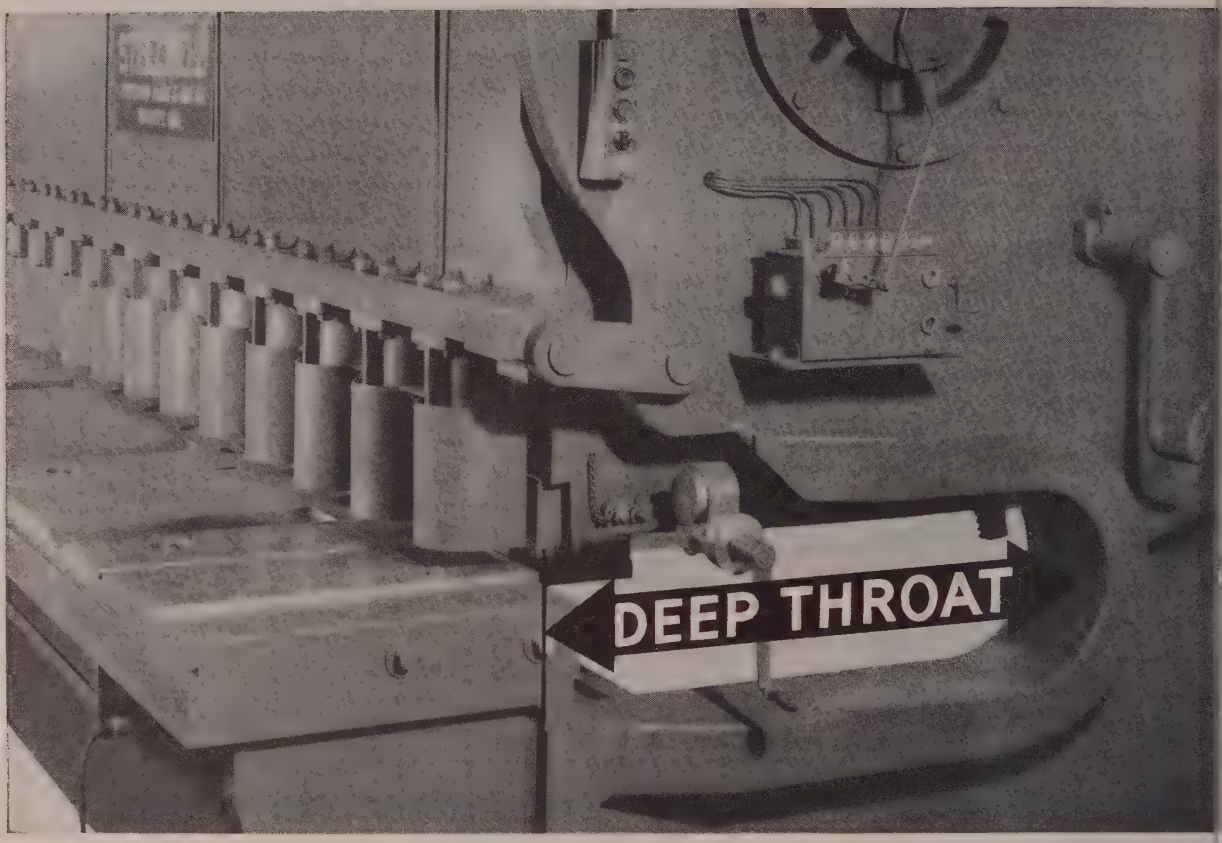
7. Low Maintenance—Ventilated from the top, "Fleetwelder" operates cleaner . . . needs less attention. Coils are permanently anchored, cannot become loosened to wear the insulation and short out. Easy accessibility to all working parts.

8. Current Stays Set—Once set, current settings do not change . . . are "locked" in position by rugged drum type holding devices. Illuminated dial shows setting of welding current.

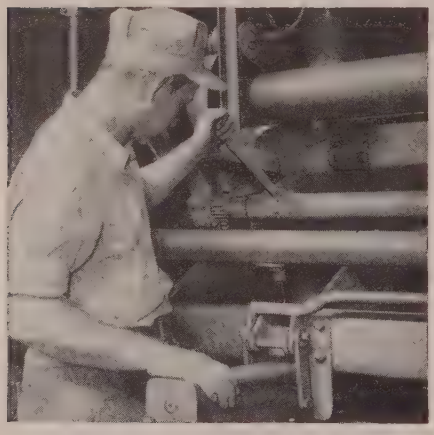
9. Steady Arc—"Fleetwelder's" reactor control is a free circuit designed for high responsiveness to changing arc conditions.

10. Compact, Portable—Only 35″ high, 22″ x 26″ at base, "Fleetwelder" requires less space. Has connection for simple hookup to 220 or 440 volt line. Can be furnished with three wheel undercarriage for moving around the shop.

11. Instant Penetration—The extra current for arc striking also gives *complete penetration* at once . . . no more cold overlaps or partial penetration at the start of the weld.



WIDE SHEETS EASILY SLIT



Steelweld Shears are built for thicknesses of 10 gauge to 1¼ inch and for lengths of 6 to 20 feet.

Throat depths of 24 and 36 inches make it easy to slit wide sheets on Steelweld Pivoted-Blade Shears. Twenty-four inches is the standard throat depth for all machines. Thirty-six inch throats can be provided as a special feature for many of the larger size machines

With such deep throats it is possible to slit plates of 48" to 72" wide down the middle for any length

It is a simple matter to adjust the blade for slitting. The easily-reached slitting adjustment shaft is turned by a spanner wrench as illustrated. When adjustment has been completed a locking devise holds it securely in position.

Steelweld Shears are loaded with exclusive features that make operation easier and speed production. There are no other shears like them.

GET THIS BOOK!

CATALOG No. 2011 gives construction and engineering details. Profusely illustrated.

THE CLEVELAND CRANE & ENGINEERING CO.

7812 EAST 282nd ST. WICKLIFFE, OHIO

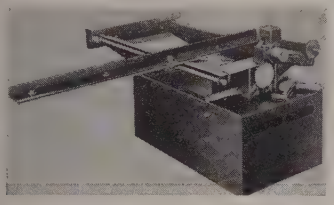
STEELWELD PIVOTED BLADE SHEARS

umalap Corp., Dept. ST, 151 W. ide Ave., Jersey City 5, N. J.
OR MORE DATA—CIRCLE REPLY CARD NO. 21

ortable Power for Slitter

. . . no mounting, dismounting

Power unit developed for indeendent use with all the manufacurer's slitting attachments is eadily attached, compact, portable



nd simple in design. It is availble separately for shops already aving slitting attachments, but an be purchased as a complete, elf-power unit with slitter models.

Complete power unit and attachment make a unit that eliminates he need for periodically mounting nd dismounting the slitter on the hassis. Lockformer Co., Dept. ST, 4615 W. Roosevelt Rd., Chicago 50, ll.

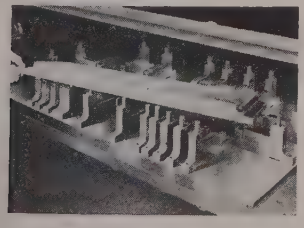
OR MORE DATA—CIRCLE REPLY CARD NO. 22

Horizontal Hole Punchers

. . . for shaped and formed work

Line of type H horizontal hole punching units is designed for work in curved and straight flanges, rims and angles. Hole punching in the side of work instead of on top of flat surfaces is made possible by design that permits punches to move horizontally rather than up and down. One advantage: Considerable expense in built-up, single-purpose cam-action dies is eliminated.

Each unit is independent and self-contained. This permits the

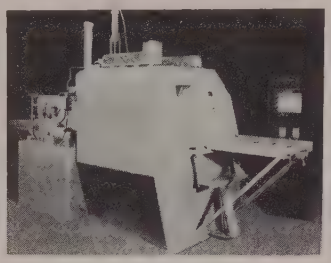


same group of units to be used and re-used on press brake rails and on templates in stamping presses. Nothing is attached to press ram. Because patterns are set up outside the press, downtime between production runs is minimized. Wales-Strippit Corp., Dept. ST, 345 Payne Ave., N. Tonawanda, N. Y.
FOR MORE DATA—CIRCLE REPLY CARD NO. 23

Automatic Heat Treater

. . . capacity: 300 lbs. per hour

This 300-pound-per-hour automatic heat treating unit has 100 per cent forced convection heating and long-life radiant heating tubes. It operates at temperatures to



1800° F; also features controlled atmosphere, automatic handling.

FOR THIN, NON-POROUS, FAST-SETTING, ACID AND ALKALI RESISTANT MORTAR JOINTS

use DURISITE CEMENT

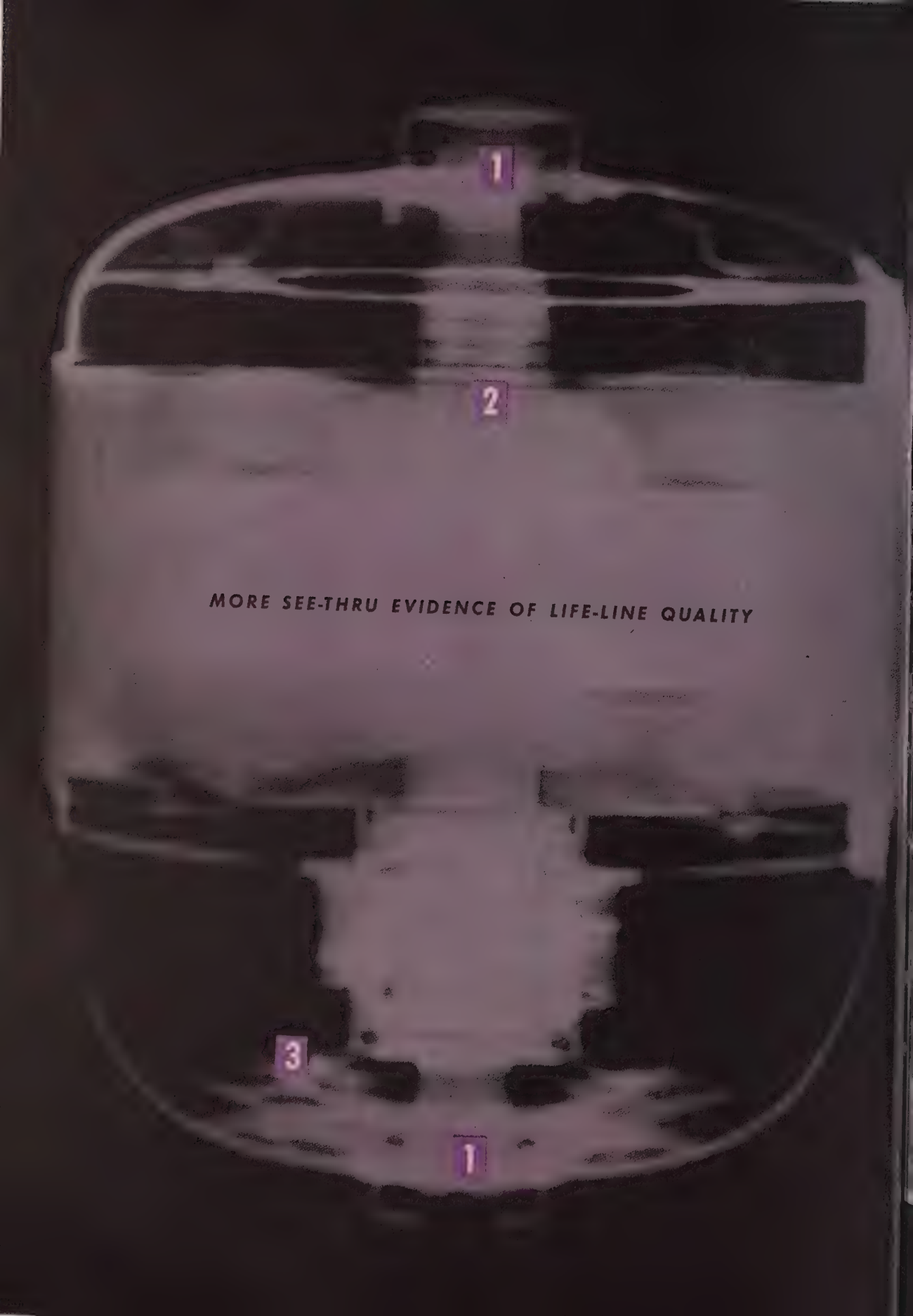
DURISITE is the furane based cement that gives you better constructed, more versatile, longer lasting, corrosion-resistant masonry. It's the cement that resists weak and strong acids, weak and strong alkalies, and all solvents. It's the cement that handles acids and alkalies alternately. It's the cement that gives you the tightly-bonded, extra-thin joints that are so all-important to a rugged floor or sturdy tank lining.

What's more, Durisite is quick-setting and chemical hardening. It's dense and non-porous with a water absorption of less than ½ of 1%. It has high compressive strength. It's non-toxic. And, it can be stored indefinitely, without deterioration.

If you're planning some corrosion-resistant masonry, be sure to use Durisite. It's the means to the end of expensive maintenance, repair, or premature failure. Write, today, for full information.

494C

THE U. S. STONEWARE CO.
AKRON 9, OHIO
PROCESS EQUIPMENT DIVISION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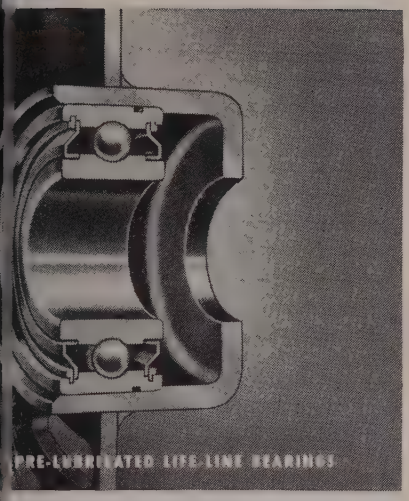
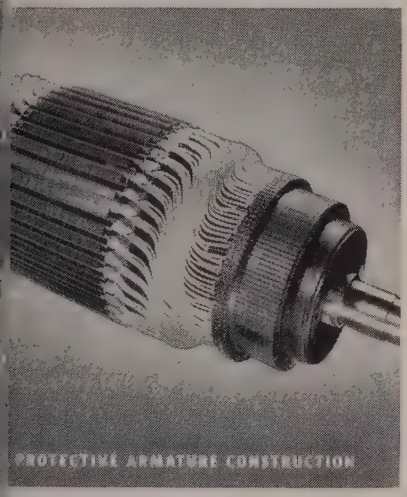
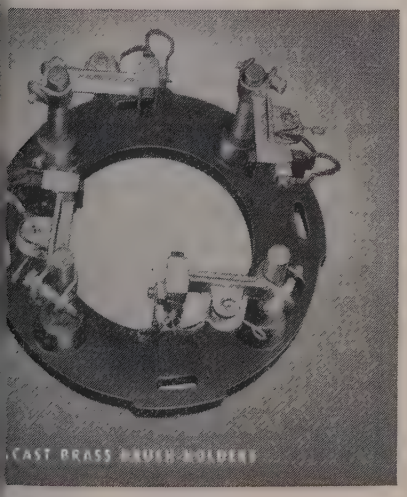
MORE SEE-THRU EVIDENCE OF LIFE-LINE QUALITY
3
1







X-Ray camera probes *Life-Line* d-c motor

Here, for the first time, you actually look through the muscle and sinew of a ¾-hp Westinghouse d-c motor. Note the Life-Line* construction features that assure dependability in the SK motor line.

Starting with the all-steel frame and feet, you can see the sturdy protection that is built into each SK motor. Angled steel-plate feet are welded right to the frame offering plenty of resistance to shock or vibration.

Pre-lubricated Life-Line bearings—Looking at inset picture #1, you see in greater detail why SK motors never need greasing. This Life-Line pre-lubricated bearing is factory packed with just the right amount of grease . . . specially compounded to inhibit oxidation or deterioration. A double seal on the Life-Line bearing is positive assurance that grease stays in . . . dust and dirt stay out.

Protective armature construction—Inset #2 pictures the SK armature's compact windings of special Tufvar® insulated wire. This enamel insulation provides a tougher, more flexible finish to stand up to heat, moisture or corrosion.

After construction, each SK armature is dynamically balanced to .001″, reducing vibration to a minimum.

Cast brass brushholders — Move your eye to inset #3 and you see at a glance the ease of adjusting or replacing brushholders. The entire assembly is made of cast brass for maximum corrosion resistance. Notice too, that no lever arm is used. A flat steel spring bears directly on the carbon brush. Thus, there are no bearing parts to bind, wear out or jam. Proper brush tension is always maintained.

Investigate these dependable d-c motors by calling your local Westinghouse representative, or write for Bulletin B4595, Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-21749

*Trade-Mark

YOU CAN BE SURE...IF IT'S

Westinghouse

The requirements exacted of surface grinding machines leave no room for variation. Precision and tolerance control must be built-in. Through the years Grand Rapids Grinders have demonstrated the highest quality and unquestioned dependability of performance. Upon this record they have been accorded world-wide acceptance as standard of the industry. Here is precision beyond question.

GALLMEYER & LIVINGSTON CO., 307 Straight Ave., Grand Rapids, Mich.

GRAND RAPIDS GRINDERS

MANUFACTURERS OF SURFACE GRINDERS, CUTTER AND TOOL GRINDERS, TAP AND DRILL GRINDERS

GALLMEYER & LIVINGSTON

NEW PRODUCTS and equipment

Model provides complete automatic straight through operation from heat to cooling or oil quench. It answers a variety of metal treating needs, including carburizing, normalizing, stress relieving and brazing. Complete atmosphere control during both heating and quench cycles means bright, scale-free work. Hence, no pickling or blasting operations are required before plating or painting. Ipsen Industries Inc., Dept. ST, 715 S. Main St., Rockford, Ill.

FOR MORE DATA—CIRCLE REPLY CARD NO. 24

Chamfer Micrometer Gage

. . . fast depth computation

This chamfer micrometer gage provides a fast, accurate method of reading end diameters of chamfers and computing chamfer depths. It

reads accurately and directly end diameters up to 1 inch from 0 to 90 degrees chamfer.

A master check bar with known indicated diameter and chamfer is furnished with each gage for checking micrometer calibrations. Acme Industrial Co., Dept. ST, 200 N. Laflin St., Chicago 7, Ill.

FOR MORE DATA—CIRCLE REPLY CARD NO. 25

Metal-Polishing Cobs

. . . fast dry, fine polish

Cocob — ground, cleaned and milled corn cobs—is used a reported three or four times longer than sawdust as a polisher and absorbent agent in drying metal stampings, ball bearings, etc. It is available in five standard mesh sizes for industrial use and can be processed oblong or spherical in shape. Agri-Indus Mfg. Co., Dept. ST, 1327 Huntington Bank Bldg., Columbus 15, 0.

FOR MORE DATA—CIRCLE REPLY CARD NO. 26

H. J.
Here's a really fantastic letter!
P.W.

BANNER TOOL COMPANY

BANNER tools DETROIT

Fine TOOLS FOR INDUSTRY

17243 FILER AVENUE - TWINBROOK 2-4900

DETROIT 12, MICHIGAN

June 16, 1952

Cities Service Oil Co.,
3049 E. Grand Blvd.,
Detroit 2, Michigan
Attention: Mr. P. E. Watts

Dear Sirs:

We called upon the services of your lubrication engineer, Mr. A. J. Blake, in reference to a serious staining condition which we were having with our soluble oil. He analyzed this condition and recommended one of your Chillo Oils. This oil was tried and the rust condition eliminated to our satisfaction.

To our surprise on his next visit he was dissatisfied with our tool life and suggested we use a soluble oil called "Chillo A". Now not only do we have clean machines, but tool life has been increased 20%! While in our plant he asked permission to "look around", which, of course, was granted.

We were using a tapping compound with precision ground taps in order to hold to close tolerances. We did not consider tap breakage excessive but the removal of broken taps was sometimes rather expensive. He recommended we use "Chillo 10Z". Then came the surprise of our lives! With Chillo 10Z we have gone to commercial ground taps (a 300% savings) and can still hold our same tolerances, with a sharper thread, increasing tap life a minimum of 20% plus eliminating expensive removal of broken taps!

We also have a production stamping job which required a new set of dies every month. On his recommendation we tried Chillo 10Z with these dies. Now our die life has increased to at least two months...a saving in die life of 100%, disregarding labor costs. We also increased production 200% per die sharpening!

We tried the same oil on our broaching operation and found that instead of making two cuts we can get the same results now with one. We were using one of your competitors' hydraulic oils and you told us it was a "good oil" and would give us satisfactory performance. BUT, GENTLEMEN, WITH THE EXCELLENT SERVICE YOU HAVE GIVEN, PLUS THE TIME AND MONEY SAVED, YOU MAY REST ASSURED THAT ALL OF OUR LUBRICATING REQUIREMENTS WILL BE PURCHASED FROM YOU.

Yours very truly,

BANNER TOOL COMPANY

S. F. Olesak

S. F. OLESAK

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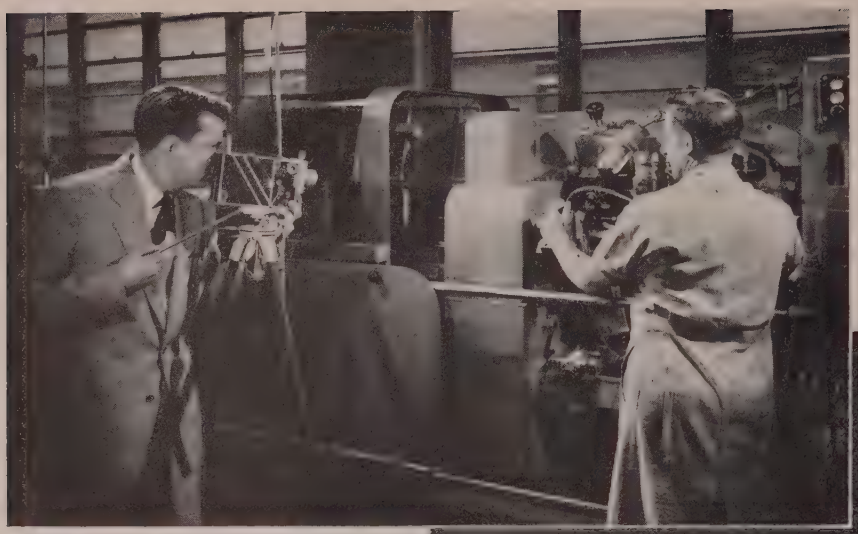

By RALPH H. STEARNS
Industrial Engineering Department
General Motors Institute
Flint, Mich.

Movies Add Dimension TO PLANT PICTURE

Aside from conventional training purposes, industrial movies taken in the plant afford constructive analysis of operations of men and equipment along production line

TO MODERNIZE the often quoted saying, one picture may be worth $1000 (or more) to your company.

Today, many plants are cashing in on the power of pictures through the medium of movies. They are realizing important savings in manpower and equipment by using motion pictures (often taken by their own personnel) to study such things as faulty action and points of wear on machinery, manual operations, evaluation of individual performance and flow analysis. Other uses include the training of industrial engineers, foremen and methods and standards personnel.

Unique advantages of using motion pictures for plant analysis include: 1. Type of observation affords greater detail and accuracy than ordinary in-the-shop monitoring or stop-watch techniques. 2. Conditions for analysis are improved, including opportunity for group viewing, ease of stopping and starting film, ability to vary speed of cycle and avoidance of noise experienced in shop viewing. 3. Film provides a permanent record.

What to Shoot — Typical case histories involve improvement of an operation or process. At a stamping plant, for instance, movies of three men unloading panels from a conveyor were shown at a training session for foremen. They observed that each man did the same thing: Remove panel from conveyor, walk to storage rack, place cardboard sheet separator on rack, then position panel.

Foremen noted that each man wasted time waiting for the other. This led to the suggestion that one man should place cardboard separators while other two carried panels. Method was put into effect and new movies were taken.

Later showings resulted in savings equal to cost of labor on job; and when it was discovered that panels could scratch at only two points, savings in material were also made. Strips were substituted for large cardboard sheets.

Suggestion Testing—A so-called suggestion often does not result in improvement. Films may be used to disprove as well as prove proposals.

In a plant where a cut-off burr on a small stud was being removed by touching parts individually to a grinding wheel, suggestion was

dvanced to revise the operation y using two wheels.

Film showed operator lost time ositioning two studs simultaneous-, because he was faced with the oubtful task of focusing his eyes n two points at the same time. urther suggestions resulted in a lide mechanism. This strategy voided positioning, but, again, lms showed a time loss, which was neasured by projecting and count-ng individual frames—in this case, ach frame had a value of 1/16 econd.

Solution was reached by shorten-ng slide and tapering its opening o reduce positioning and sliding ime. Although total time for the peration was just 0.03 minute, a aving of 0.01 minute meant a 50 er cent increase in production.

Flow Study—Film was made in fender stamping plant to follow abrication of fenders through all work stations. Picture started with ntrance of coils of steel at plant nd ended with stacking of fenders.

Groups of supervisors studied the

Standard Camera Speeds

1 frame per second or 100 frames per minute. . . memo-motion
8 frames per second or 500 frames per minute. . . double speed
16 frames per second or 1000 frames per minute. . . standard silent speed
24 frames per second . . . . . standard sound speed
32 frames per second or 2000 frames per minute. . . semi-slow motion
64 frames per second or 4000 frames per minute. . . slow motion

Checklist for Taking Industrial Movies

1. Plan your shots carefully. In case of doubt, film a questionable phase of an operation rather than resort to the "shotgun" technique.
2. Before shooting, talk it over with plant personnel concerned, including the supervisor, foreman and operator. If possible, let operator see finished product.
3. Keep "extra" lighting at minimum. Glare will disrupt normal operation.
4. Pick the film and lens to fit the job. Slower, finer grain film will project more clearly than film that's too fast. If you think copies will be requested, use negative film. Correct lens will depend upon amount of detail needed.
5. Find the best angle, which often isn't at eye level. Remember one hand can block out what the other is doing and avoid excessive panning. Of course, time should be taken to set up each scene.
6. Be sure exposures tell the whole story. You can trim but not add when editing the film. Special points are underlined by using effects, such as slow motion.
7. Written record of what is being taken is advised. This aids analysis when movie is later projected.

Movies Aid Study of Machine Design

First step: Photograph operation. Engineer takes own shots

He then projects film to chart time needed for each job part

Suggested design changes are discussed with the designer

New or better machine is end result. Engineers check it out

Engineers at Eastman Kodak Co., Rochester, N. Y., use 16 mm, micro-motion (1000 frames per minute) movies to study machine design.

Usual practice is for the engineer to take the movies himself. When they're projected, he reduces the process to a standard chart form. This is facilitated by film speed: He can divide a minute into 1000 parts and determine how long a machine or operator takes to perform a given operation.

Record—Typical chart has two columns — one representing the right hand; the other, the left. What each hand is doing at all times during the operation is noted on the chart. Examples are: Type of movement (if any), length of time required for each movement and whether hands are engaged in productive activity.

Chart is considered completed when the engineer can tell—almost at a glance—whether the operation is efficient from both a mechanical and operative standpoint; and if not, what parts of the operation are the weakest.

Harden Piston Rings with HEVI DUTY BOX FURNACES

U.S. Hammered Piston Ring Company of Stirling, New Jersey, manufacturers of aviation piston rings, found that very close tolerances could be met when hardening their rings in Hevi Duty Furnaces.

These furnaces operating 24 hours a day treat thousands of rings in size from 1 to 33 inches in diameter. Leo Maren, Plant Superintendent, says, "I have used Hevi Duty Furnaces for over 20 years. I like the even heat and uniform temperatures afforded by the heating elements located on the six sides of the work chamber."

Learn more about the many features that are designed into Hevi Duty Box Furnaces.

Write for Bulletin 441.

HEVI DUTY®

HEVI DUTY ELECTRIC COMPANY

MILWAUKEE 1, WISCONSIN

Heat Treating Furnaces... Electric Exclusively

Dry Type Transformers *Constant Current Regulators*

film to check plant layout and materials handling system. Since they had the opportunity to observe and analyze each phase at leisure, they were able to formulate a more effective flow of work and reduce extra handling and trucking.

Diversity — When movies are carefully planned and executed they can be capitalized upon to do a number of useful things, including the making of plant records, facilitating exchange of interplant information and providing material for training and conferences.

In a plant changing over to defense work, movies were made of major non-defense jobs to avoid delays in re-establishing them at a later date.

To train its industrial engineers, another plant filmed three operators performing the same lathe operation.

This technique aided the students in planning and studying operations on the floor. They were able to see that differences in method, rather than tempo, account for most of the variations in output. Some of these variations in method could be detected only by film.

WESCON Draws Large Crowds

Nearly 14,000 engineers, scientists and technicians registered for the technical sessions and exhibits at the 1953 Western Electronic Show and Convention during its three day run in the San Francisco Auditorium, August 19-21.

WESCON, co-sponsored by the Seventh Region, Institute of Radio Engineers and the West Coast Electronic Manufacturers' Association, set new records for attendance, exhibitors and booths, and the number of technical sessions and papers.

Next year WESCON will convene in the Pan Pacific Auditorium, Los Angeles, from Aug. 25-27.

U.S. Synthetic Plant May Be Sold

Fate of the government-owned Missouri Ordnance Works and Synthetic Fuels Demonstration Plant, both at Louisiana, Mo., is under study by the Department of Defense. If it is found that the properties need not be retained by the government, they will be offered for sale or lease to private parties.

COMING OFF THE LINE
. . . attachments are cast in place

Casting TV Bezels

Rapid production, delivery and low tool cost are some benefits this firm achieves

DIE CASTING, already a heavy supplier to the radio and TV industry, is being increasingly specified in TV set design. One example: Precision Castings Co. Inc., a nine-plant custom die caster, is currently die casting bezels for the 17 and 21-inch range of the Sylvania Electric line.

It was decided to die cast these bezels in zinc because of rapid production and delivery and low tool cost. Design freedom, particularly in ornamental control knob area of

REMOVING FLASH
. . . units have excellent rigidity

Carburize Gears in HEVI DUTY FURNACES

Western Gear Works, a leading manufacturer of high quality aviation gears, uses Hevi Duty Vertical Retort Furnaces to carburize and normalize. These furnaces are required to treat many sizes of special gears made from a variety of steels including Boron Steel.

G. R. Leghorn, Chief Metallurgist of the Western Gear Belmont Plant, says, "Using these furnaces with zone temperature control and forced circulation of the carburizing atmosphere inside the sealed retort, we are always sure the gears will be treated to the exact case depths and carbon concentrations required."

You, too, can produce consistently uniform results if you specify Hevi Duty Vertical Retort Furnaces for Carburizing, Nitriding, Dry Cyaniding, and Bright Annealing.

HEVI DUTY®

Write for Bulletin 646.

HEVI DUTY ELECTRIC COMPANY

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Heat Treating Furnaces... Electric Exclusively
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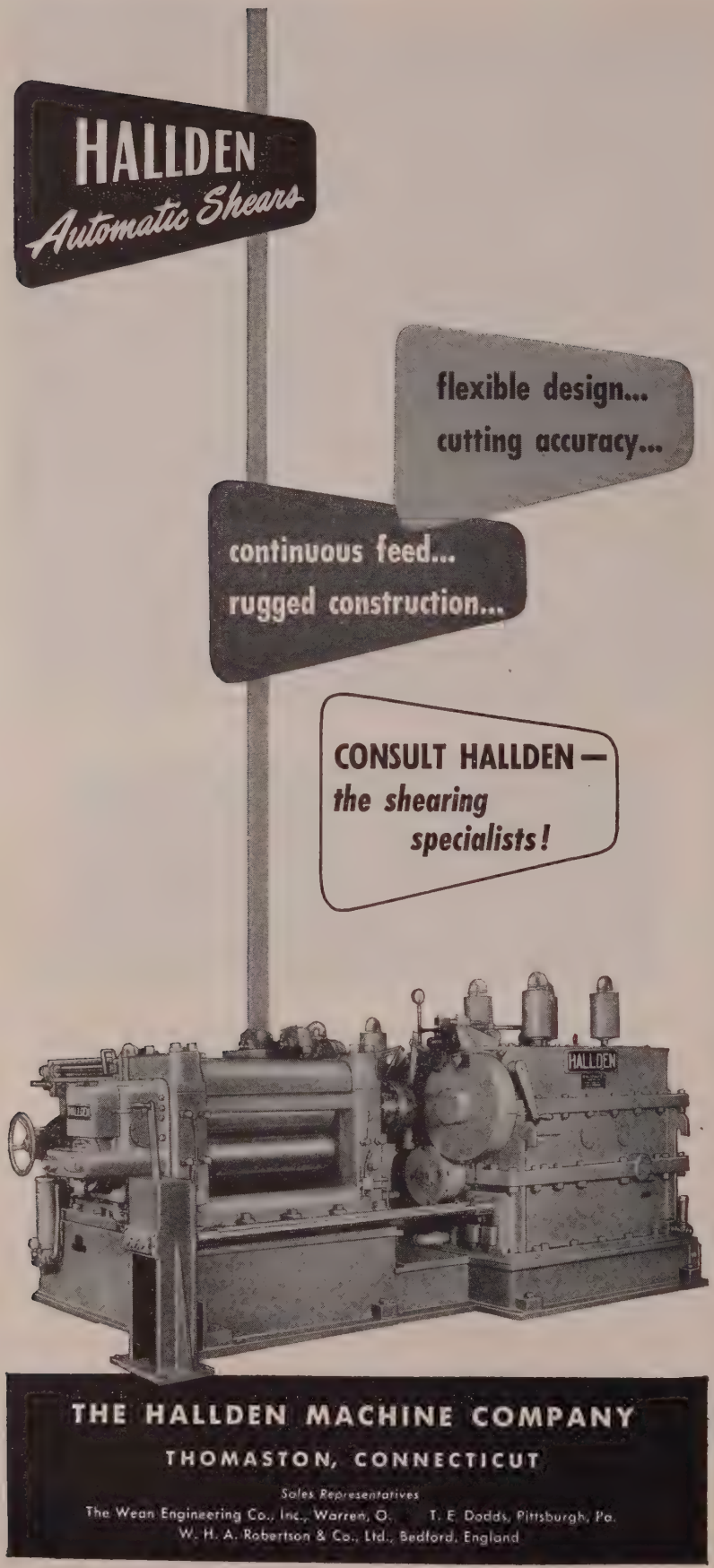


the bezel, was also provided at good tool cost.

Low Tolerance—All the attachment bosses were cast right in the piece, thus holding down assembly time and cost. Because of the low tolerances, trouble free assembly was also assured. In addition, the die cast bezel was found to gain excellent rigidity.

These bezels were die cast at Precision's Fayetteville, N. Y., plant in single cavity dies. The heavy flash typical of such large parts, called for a substantial flow of metal which was removed in specially tooled stamping presses and by hand punching operations. Final finish involved gold and coppery red and was applied by spray painting at Sylvania plants.

Flame-Retardant Connectors

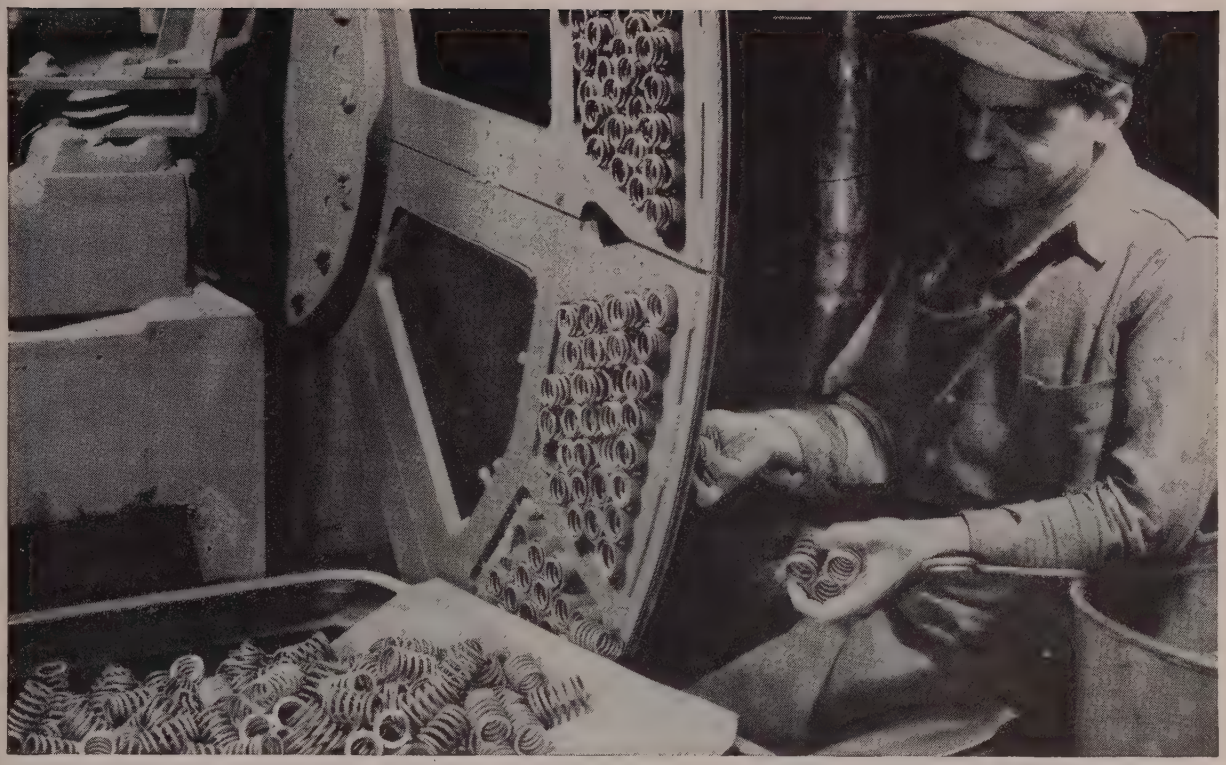
Heater ducts carrying air at a temperature higher than the melting point of solder are being coupled with a new flame retardant silicone rubber produced by General Electric Co.'s silicone products department. Every bend in more than 40 feet of aluminum exhaust ducting in the model 340 Convair-Liner is made flexible with glass cloth connectors coated with SE-101 silicone rubber.

According to Consolidated Vultee Aircraft Corp., the ducts carry air at 450° F and are designed for temperatures as high as 600° F. The silicone was selected for its ability to withstand this heat as well as for its crease and abrasion resistance and unusual flame retardancy. It is also unaffected by Skydrol hydraulic fluid which, in event of a leak, might otherwise damage the ducts.

Both SE-100 silicone rubber and the new SE-101 are said to have the glass-to-glass bonding strength and fast-curing properties required for mandrel wrapped heater ducts and similar flexible tubing applications.

Partlow Issues Bulletin

Partlow Corp., New Hartford, N. Y., announces the availability of bulletin No. 109 which gives specifications and engineering details on the complete line of Partlow refrigeration controls.



Users tell the quality story

Precision Spring Corp. Depends On Pittsburgh Steel Oil Tempered Spring Wire For Uniformity

Nothing, absolutely nothing, can raise Cain in a spring shop like wire that does not come up to analysis specified. Take complicated coiling machines like the automatic Torrington or Sleeper-Hartley, feed them steel wire at high speed that is a fraction off grade and wham! . . . you're in serious trouble. Mr. A. H. Peterson, president of Precision Spring Corporation, Detroit, Michigan, prominent spring maker for the auto industry, puts it this way: "Pittsburgh Steel's Wire has good uniformity. That's why we use it. We can depend on this wire to work well in production, ton after ton. Every spring we make must meet the customer's specifications for length, diameter, load, and deflection."

It all adds up to this: Lack of uniformity in steel wire within its specifications for grade can knock the profits out of spring making. One failure in fifty springs can turn it into a loss item. Spring failure in an automobile can put a spring maker out of business.

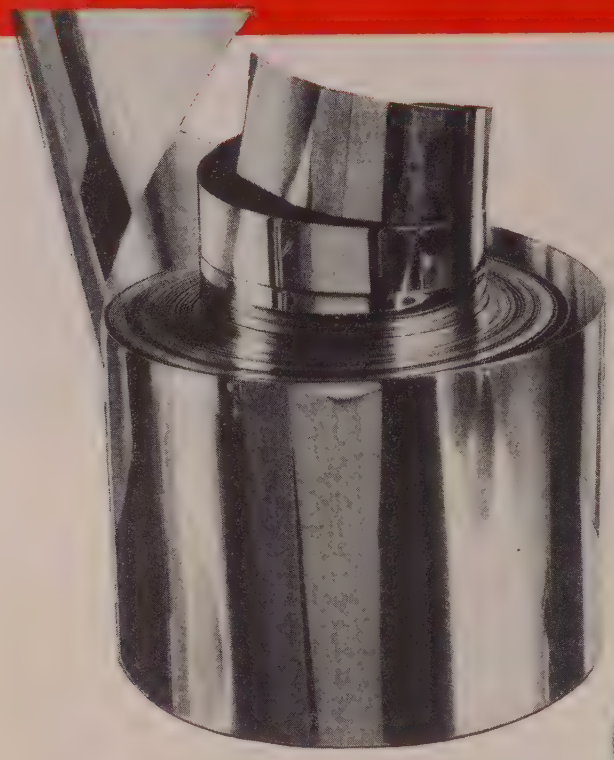
The men who make and sell Pittsburgh Oil Tempered Spring Wire would like to serve you. They would like to have you depend on them as one of your regular sources of supply.

Call our district office in your area, or write a note to Department S, Grant Building, Pittsburgh 30, Pa., for complete information about Pittsburgh Steel Wire.

Pittsburgh Wire

a product of **Pittsburgh Steel Company**

NICKELOID METALS STARTING POINT FOR PRODUCT DESIGN



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Nickeloid Metals—brilliant pre-finished metals in sheets or coils—are ready-plated with the finest, quality plating of chromium, nickel, copper or brass. Being finished, they are ready for fabrication and assembly. They require no further finishing. They are durable, easy to fabricate. Nickeloid Metals provide a production short-cut that usually provides a basic economy in cost. Thus Nickeloid Metals are more than a raw material . . . they represent a streamlined method of production: raw material to finished part. Many operations are eliminated or short cut. Nickeloid Metals deserve further study on the part of every progressive manufacturer.

Nickeloid pre-plated finishes available in these base metals: Steel, Zinc, Brass, Copper, or Aluminum.

CREATES A NEW SALES APPEAL

The appeal to the buyer of products that have that smart, modern finish, is undeniable. The list of successful applications that have employed Nickeloid Metals to enhance eye appeal is long. From buttons to rotisseries . . . smart designers and alert manufacturers are cashing in on the basic production economy and sales appeal offered by these pre-plated metals. Our representatives, located in most principal cities, will be glad to show you samples of successful applications. They will be glad to submit working samples of metal for experimental purposes. They will be glad to give you the benefit of Nickeloid's half century of experience in the fabrication of these brilliant, gleaming, durable metals.

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Plastic Degreasing Coat

Vinyl plastisol, from Geon paste resin, succeeds as tote basket coat on degreasing job

TOTE BASKETS to carry jet engine compressor blades, used at Utica Drop Forge & Tool Co., Clayville, N. Y., are being plastic-coated with a newly formulated vinyl plastisol made from B. F. Goodrich Chemical Co.'s Geon paste resin.

In order to withstand extreme corrosive effects of trichlorethylene degreasing baths used in the blade manufacturing operation, it was found that a new vinyl plastisol formulated by Stanley Chemical Company, E. Berlin, Conn., would provide proper protection. The plastisol also provides tough, durable coating for tote baskets used as protective racks and carriers throughout each stage of jet blade manufacture.

Checks Seepage—It was necessary to find a coating for the baskets because zinc covering came off easily in the trichlorethylene washing bath, dulling steel alloy jet blades.

A difficult problem was encountered in coating the baskets with an ordinary plastisol coating because in test runs the trichlorethylene would seep underneath the covering and break through the plastic.

After considerable experimenting, Stanley Chemical came up with a special plastisol, 77X-1078, which resists not only trichlorethylene but also perchlorethylene. Surface of the plastic is hard enough and slick to facilitate rapid drain off and minimize carry-over. A primer is used under this plastisol to obtain maximum adhesion.

Suggested Method—The following method is suggested for coating an object that will be resistant to trichlorethylene and perchlorethylene:

1. Apply primer, reduced three to two with special thinner, by dipping. For maximum adhesion, apply two coats, allowing 10 minutes for air drying between coats. Air dry the two coats for 30 minutes. The minimum thick-

Esterline-Angus Discovers New FAST, CLEAN Rust-Proofing Method!

Wrap Out Rust with NOX-RUST Vapor-Wrapper

Prominent electrical instrument company chooses new chemically active paper to rust-proof delicate instruments

Whenever fast, clean rust-proofing is essential, wrap out rust—and keep it out—with NOX-RUST Vapor-Wrapper. Easy to use as wrapping paper, Vapor-Wrapper rust-proofs everything from massive printing presses to precision micrometers . . . delivers them to your customers clean and ready for use.

The Esterline-Angus Co., Indianapolis manufacturer of electrical instruments, uses Vapor-Wrapper envelopes and sheets to prevent rust from forming on drive shafts and armatures and to assure "factory-fresh" deliveries.

The chemical *within* Vapor-Wrapper—an exclusive NOX-RUST development—makes moisture-laden air non-corrosive . . . *without the need for an air-tight package* . . . without deposits forming on metal surfaces during shipment or storage. If metal products are your business, *you* can cut costs and improve service with Vapor-Wrapper. Contact NOX-RUST—*Specialists* in scientific rust prevention.

Vapor-Wrapper conforms to Military Specification MIL-P-3420, Packaging Materials, Volatile Corrosion Inhibitor Treated.

Write for full details on Vapor-Wrapper NOW!

This booklet points the way to real savings in rust prevention. It describes Vapor-Wrapper in detail and tells how leading companies use it to save up to 75% on packaging costs. Please write on your letterhead, today!

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Condenser Space Saver

Three space and cost-saving features are combined in this 12 x 16-foot 3-inch front water box for a 50,000-sq ft surface condenser being built by Allis-Chalmers Mfg. Co. Distinctive aspects are hinged covers, a 30-inch motor-operated butterfly valve in the vertical division wall, and 90-degree elbows in the water inlet connection

---

ness of the primer coating should be 1.5 mils.

2. Bake the primer for 10 minutes at 400° F.

3. While object is still hot, dip it into the plastisol and keep immersed for 20 to 30 seconds.

4. Withdraw very slowly.

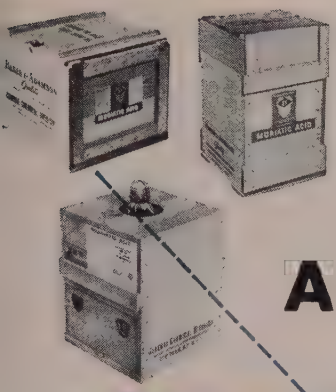
5. Bake the coated item for 30 minutes at 385-400° F, making sure that temperature control is accurate.

Length of baking depends on mass of metal being coated. Thirty minutes is minimum time.

Testing Machine Ordered

An order for one of the largest universal testing machines ever built has been placed with Baldwin-Lima-Hamilton Corporation, Philadelphia 42, Pa., it is announced. The new hydraulic machine has been ordered by Lehigh University, Bethlehem, Pa., for delivery not later than February, 1955.

Although the machine will be the third testing machine of 5,000,000 lb capacity built by Baldwin for tests in tension, compression, and flexure, its height of 57 feet is eight feet more than the next largest and 10 feet more than the first machine of this capacity.



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NEW WILLSON Interchangeable Respirator

First truly interchangeable respirator. Requires no additional parts or accessories to use any one of the cartridges, filters, or combinations shown.

For Organic Vapors (BM2308)
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These Respirators are individually packed in sealed, transparent plastic bags enclosed in a sturdy metal-edge box.

Write for the new bulletin fully describing these new Willson Respirators. Standardization on the new Willson No. 800 Interchangeable Respirator can greatly simplify your respiratory protective inventory.

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WILLSON PRODUCTS, INC., 233 Washington Street, Reading, Pennsylvania

Pressing out Wrinkles

Inexpensive over-press cover plate is making handfinishing unnecessary after hydropressing

INNOVATION in hydropress operation at Temco Aircraft Corp., Dallas, virtually eliminates wrinkles in pressed aluminum parts.

Officials figure the inexpensive gadget—called an over-press cover plate—nets the firm a $5816 annual saving by making handfinishing an unnecessary aftermath to hydropressing. In operation, the system merely substitutes a second trip under the hydropress for lengthy hand-forming with mallets.

Second Trip—Flat work is still placed on dies and hydropressed once in normal fashion. It comes out of this operation shaped generally to fit the die, but seldom

TOP-PRESSURE WRINKLES
. . . no more hand smoothing

to fit inspection standards. The reason is that hydropressure is not delivered directly to die sides. As a result, wrinkles from top pressure form on part sides and side joggles come out imperfect.

These wrinkles formerly were smoothed by hand. Now the overpress plate performs the same job when it accompanies the part and die on a second quick trip under the hydropress.

The plate consists of a flat piece of 0.125-inch aluminum, shaped to conform to the die top. This plate lies on top of the part, between it and the rubber face of the hydropress. Two steel rims, or

There's a mightier smith under the POLLOCK roof!

A mighty man was he . . . but even Longfellow's smithy couldn't forge the many tons of angles used in the construction of a modern blast furnace. At The William B. Pollock Company that job is done by the angle bending rolls you see above.

These rolls bend angles from 2" x 2" to 5" x 5", and bars from 1" x 3" to 2" x 4" on edge, and from 1" x 3" to 1¼" x 4" flat bending, quickly, accurately and economically.

Bent angles and bars are used in blast furnace construction as flanges for gas mains and miscellaneous piping, and as supports for brick, rings and shelves. Also as shield stiffeners on hot metal and cinder cars, brick retaining members on ladle tops, etc.

These bending rolls are another example of how The William B. Pollock Company develops and maintains the special modern facilities required to meet the demands of iron and steel manufacturers throughout the world . . . facilities that speed production and reduce over all costs on big jobs.

Pollock-built Blast Furnaces

Pollock-built Hot Metal Ladle Cars

Pollock-built Open Hearth Ladles

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Since 1861

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BLAST FURNACES • HOT METAL CARS AND LADLES • CINDER AND SLAG CARS • INGOT MOULD CARS • CHARGING BOX CARS • WELDED OPEN HEARTH LADLES

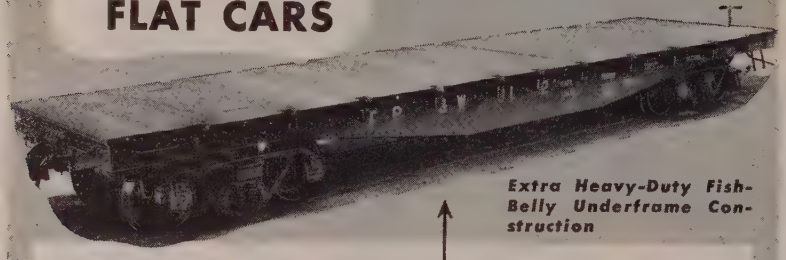
flanges, are hinged to the top plate by means of metal attach strips which are riveted to rims and top plate. These rims hug the sides of the die and the part it is forming.

Obtuse-Angle Flare—Rim and top plate are joined to form a right angle. But the flexible attach strips allow rims to flare out to an obtuse angle in order for the entire over-press plate-top and rims to be placed over the part and its die after the first hydropressing. Pressed again, a standard pressure is brought to bear on part's sides by rigid steel rims.

Rims prevent buckling and equalize pressure. They, in effect, are a forming die on the outside of the part which gives hydropress force more specific direction.

To date the company has made over-press plates for about 175 dies, at a total cost of approximately $400. The over-press plates have been used to form aluminum up to a thickness of 0.040-inch.

70-TON
(170,100 lb. load limit)
FLAT CARS
for HEAVY DUTY HAULING



Extra Heavy-Duty Fish-Belly Underframe Construction

CENTER SILLS . . . Double fish-belly type fabricated of steel plate and angles 17" deep from bolster to end sill, and 24" deep at center of car. Sills have inside and outside 4" x 3" bottom angles, and 4" x 3" outside top angles. Center sills are continuous from end sill to end sill with 22" wide top coverplates.

SIDE SILLS . . . Heavy-duty fish-belly type, built-up of steel plate and angles 9" deep from body bolster to end sills, and 24" deep at center of car. Sills are constructed with 4" x 3" inside angles top and bottom.

The exceptionally heavy and rugged underframe construction of these cars classes them apart for bonus performance . . . trouble-free operation and years of added service. For 70-ton requirements (170,100 lbs. load limit) these CFC REBILT flat cars are premium buys for you.

To meet requirements where nominal capacity demands are under 50 tons (132,-100 lbs. load limit) these cars are available with 50 ton trucks. Thus, substantial initial cost-of-car savings are effected as well as the cost of hauling the weight of heavier trucks.

GENERAL SPECIFICATIONS

	70 TON	50 TON
Capacity, Nominal:	140,000 lbs.	100,000 lbs.
Light Weight Approx.:	39,900 lbs.	36,900 lbs.
Load Limit:	170,100 lbs.	132,100 lbs.
Length over strikers:	40 ft. 6 in.	40 ft. 6 in.
Width:	9 ft. 6 in.	9 ft. 6 in.
Trucks:		
Capacity, Nominal:	70 TON	50 TON
Side Frames:	Cast steel, full U section	Cast steel, full U section
Wheels:	33" dia. steel	33" dia. cast iron
Axles:	6" x 11"	5½" x 10"

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Films To Aid Galvanizing

ELECTROPLATED films may be used to improve the process of hot galvanizing strip steel by protecting the treated surfaces of the steel prior to coating. This is the opinion of Allen T. Baldwin, Hanson-Van Winkle-Munning Co., Matawan, N. J., who has completed experimental studies on hot galvanized coatings.

Any steel surface must be completely free of oxide and non-metallic materials before galvanizing. If it is not, molten zinc will not alloy with the ferrous surface. Surfaces can be freed of iron-oxide by ordinary pickling. But under ordinary conditions, particularly where continuous methods are in use, iron surfaces tend strongly to reoxidize.

Retards Oxide Formation—"We've found," Baldwin explains, "that a film of non-ferrous metal plated to the ferrous surface can retard, and possibly prevent the formation of any iron oxide on the surface. The film itself might oxidize, but these oxides would not have as harmful an effect."

Examined in the experiments were thin platings of iron, zinc, tin and nickel. Of these, nickel, only, seems to have introduced a different structure over that obtained with platings on the regular steel base. The other metals plated showed some influence on the amount of the distinct phases, rather than the character of these phases.

Not Complicated—Inserting this electroplating step into a hot galvanizing process would not be a complicated or costly problem for the galvanizer, says Baldwin. The galvanizer would have to purchase electrical equipment, anodes and a plating tank, if he doesn't already have them. There is a real possibility that the plated film could be put on without an external voltage.

Preliminary electroplating would be especially adaptable to the continuous hot galvanizing of strip steel. With strip steel, immersion time in the zinc kettle is shorter than usual, which means that the steel has to be pre-heated. Preheating in turn calls for maintenance of steel surface, a problem electroplating apparently solves.

NEW SHAPES call for SPINFORMING and HYDROFORMING

SEMI-CONICAL

SEMI-SPHERICAL

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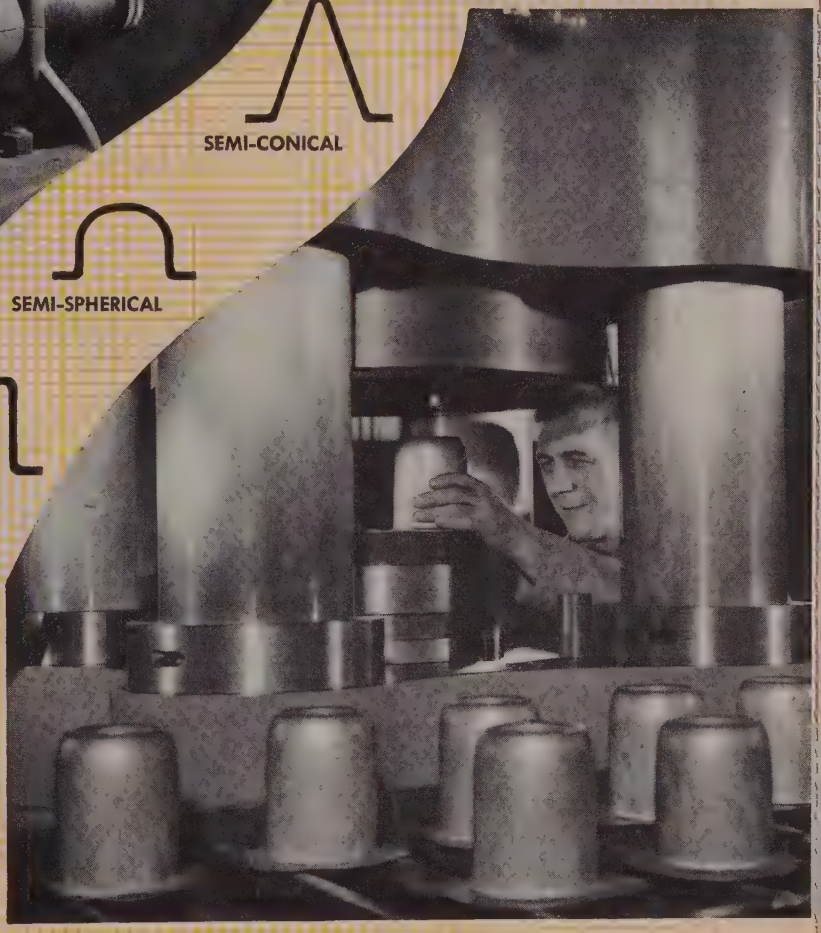

THESE TWO BASIC FORMING METHODS PROVIDE COMPLEMENTARY FACILITIES FOR THE FULL RANGE OF THESE THREE FUNDAMENTAL SECTIONS — SPINFORMING IS MOST EFFECTIVE FROM SEMI-CONICAL TO SEMI-SPHERICAL AND CYLINDRICAL, — HYDROFORMING IS MOST EFFECTIVE FROM CYLINDRICAL TO SEMI-SPHERICAL AND SEMI-CONICAL.

ROLAND TEINER CO. INC. · METAL SPINNING ·

HOW ROLAND TEINER FACILITIES CAN SERVE YOU

New techniques and engineering procedures are greatly enlarging the scope of industrial uses for spinforming and hydroforming, while the complementary nature of these facilities often permits tooling for one method to be used for quantity production by the other.

Fabricated items range from giant spinnings to thimbles; from deep drawn cylindrical pieces to one piece spout drawn pitchers and multi-shape formings, including parts from an increasingly wide range of gages, diameters and materials, as the expanding facilities at Roland Teiner continue to enlarge to better serve industry.

If you are redesigning for appearance, cost or function, or are developing new parts or products, find out about these new facilities early. Send drawings or specifications for quotations, or write for literature by title; "Spinning Principles of Economical Design", or "The Hydroform Operations Savings Table".

ROLAND TEINER COMPANY

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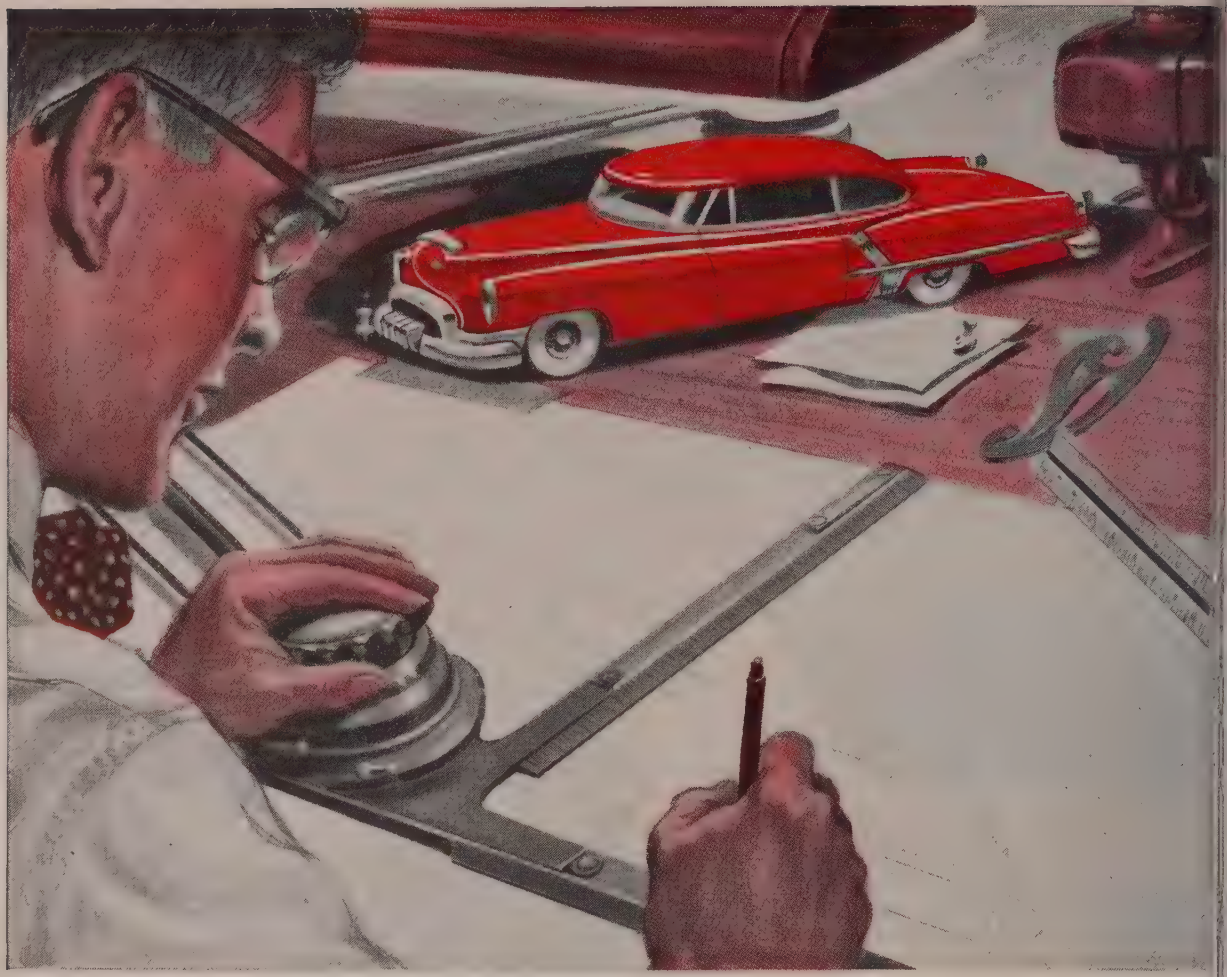

Makes automotive dreams come true

In the automotive industry, as in countless others, OSTUCO Tubing has what it takes to transform drawing board dreams into practical realities—infinite adaptability, great strength, light weight, and low cost.

Here are a few applications in passenger cars, trailers, buses, and trucks: Steering post columns, shock absorbers, bumper guards, mirror and light supports, piston pins, connecting rods, bearings, bushings, radiator and tank fittings, exhaust parts, radius rods, seat frames, sleeves, axles, and carrier racks.

Leading designers and manufacturers in practically every field specify OSTUCO Tubing, seamless or electric welded, because OSTUCO manufactures, forges and fabricates all at one plant . . . and because OSTUCO is famous for consistent highest quality.

It will pay you to consult our experienced engineers about OSTUCO Tubing for your current needs or for redesigning your products to meet future competition.

From Your Blueprint . . . to Your Product
OSTUCO TUBING
Tapering • Swaging • Flanging • Bending
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Threading • Angle Cutting • And Many Others

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Production Control . . .

Number System Is Better Than Dates

That's what two manufacturers claim for this procedure which does away with calendar dates on production records. Schedule changes, expediting reported easier, too

By FREDERICK M. GILBRETH
Consultant
McKinsey & Co.
New York

PROCEDURE which substitutes "group numbers" for calendar dates in setting up production schedules simplifies manufacturing control and facilitates changing schedules and expediting work for a company making four-color printing presses and one making chain and sprocket drives for those units.

It retains the necessary relative time schedule relationships for the various parts of an assembled product, but gains flexibility by freeing the schedules from specific calendar dates. Only off-schedule items receive supervisory attention, which results in better control at lower cost.

Two Days Per Number—In setting up the system, group numbers first are established by the production department with each number covering two regularly scheduled work days. For example, group 30 might be assigned to May 25 and 26, group 29 to May 27 and 28, and group 28 to May 29 and June 1.

Saturday and Sunday, not being work days, are not included in the group number assignments. Group numbers may start with any number (75, 40, and 30 are some of the starting numbers now in use by different companies) and run down to one, after which the cycle is repeated.

Parts Numbered — Production schedules are set up by assigning the group number of the required completion date to the last operation on the particular part. Each preceding operation is given the next highest group number in sequence. Obviously complicated parts have many numbers; simple ones few.

A group number is assigned each operation in different departments, even those taking a short time. An extra group number may be assigned where the work in a department will exceed eight hours. This provides for handling, lining up the work, requisitioning tools, making setups and performing inspections.

Use of Forms—When a part is scheduled for production, the schedule clerk obtains a parts list, bill of materials, and blueprint, together with the "ditto" master of the operations sheet. He makes out a ditto master strip which gives the customer's name (if a special), the quantity required, assigned lot number, and other pertinent information. To these he adds the correct number of blank forms for a routing envelope, dispatcher's follow-up card, identification tag or tags, raw material requisition and other necessary forms.

Before a job is released to the

Advantages of Group Numbers

1. Group numbers proved to be both practical and to serve as a promotional "gimmick" to get acceptance of the change in procedure.
2. Controls are tighter, inducing shop supervision to pay more attention to detailed schedules and departmental performance.
3. Better equipment balance is achieved since many departments showed up with insufficient work to operate two full days. This pointed up possibilities for reducing equipment and manpower. Bottleneck departments were provided more men and equipment.
4. Better controls at lower costs are achieved. Control records kept to cover parts on schedule are at a bare minimum. Clerks control these items, so that the supervisor's job is one of making only important decisions on those items not on schedule or requiring schedule changes.
5. Confusion is eliminated by segregating calendar dates, which have wide significance, from group numbers which pertain only to plant operations.
6. To some extent, stretch-out is avoided. Formerly, workers could see work ahead to some recognized date and tended "not to get it all done too soon." Lack of ready relationship between future dates and group numbers reduced the exercise of this natural tendency.

first department, a follow-up card is initiated. If the number of parts in process were small, a copy of the dispatcher's follow-up card could be used. Since the follow-up file is one of the key elements in the system, it should be kept as small and simple as possible.

Follow-up card is filed in a tub file set up by group number; within each group number the cards are filed first by part-number sequence and then by lot-number sequence. Upon receipt of the completion notice, the production control clerk refiles the follow-up card in appropriate sequence in the next lower group-number pocket. For work completed on schedule, no further attention is necessary.

Late Follow-Up—Any follow-up cards remaining in pockets of the production control files for group numbers higher than that representing the current date indicate work that is behind schedule. Since only cards covering behind-schedule work will fall in this category, they are automatically highlighted for attention.

If mating parts of an assembly also will not be available on schedule, the control supervisor may reschedule a part for later completion. With the information received from the production control clerk he can locate the part in the shop and make the necessary revisions on the operations envelope and the dispatcher's follow-up card.

If allowing the part to be completed at a later date will delay an important assembly operation, control supervisor will usually decide to expedite the remaining operations. For example, he would not want an expensive on-schedule press roll to wait for an inking pinion and would almost certainly expedite the latter.

Rescheduling Easy — Procedure described in this article also simplifies the problem of rescheduling a part to meet earlier delivery requirements. In the simplest case, work on a part would simply be started earlier. To do this, the job envelope is located in the starting tickler file, the group number revised and the envelope refiled under the newly assigned number.

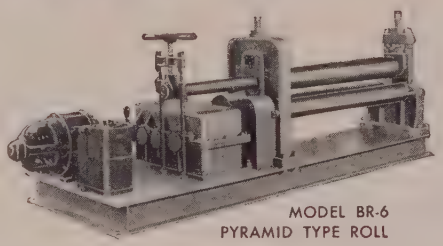
In some cases it may not be possible to start production earlier. Either of two alternatives may be followed. One is to combine operations within single groups which may cause the job to fall behind schedule, become controlled under the late work follow-up procedure and be expedited. The second alternative is to apply the expediting procedure at the time of release to push the job through all operations.

In other cases, it may be necessary to speed up work already in process to meet an earlier completion date. Recommended procedure in this case is first to locate the follow-up card. With that in hand, the operations sheet ditto to master will tell where the job may be found. Its schedule on the operations sheet and dispatcher's follow-up card can be revised, the job follow-up card revised and the expediting procedure initiated if necessary.

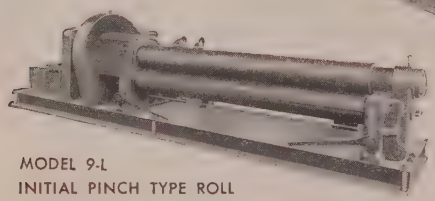
WEBB PLATE FABRICATING MACHINERY

PLATE BENDING ROLLS

The Webb Corporation offers a complete line of Plate Bending Rolls for the rolling of the thinnest plate up to plate 2½" thick. Offered in a variety of lengths and thicknesses. Constructed for the modern fabricating shop.



MODEL BR-6
PYRAMID TYPE ROLL

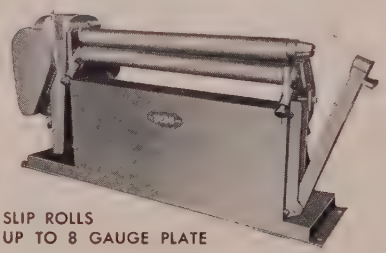


MODEL 9-L
INITIAL PINCH TYPE ROLL

Two types available: the Initial Pinch Type and Pyramid Type machines. All latest advantages of today's modern machine tools are incorporated, utilizing anti-friction bearings, totally enclosed gear drives. Special forming rolls for culvert pipe, stock tanks and other special shapes available.

SLIP ROLLS

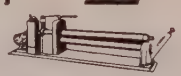
A complete line of small Sheet Metal Forming Rolls are also available. All power-driven with shaft sizes 3" to 5" for the handling of the thinnest gauge material, up to 8 gauge material. Special rolls for the forming of polished sheets, aluminum and stainless steels can be furnished. Complete catalogues on any size machine furnished upon request; write Dept. D.



SLIP ROLLS
UP TO 8 GAUGE PLATE

Let Speed PAY–The WEBB Way!

SLIP ROLLS



PYRAMID TYPE ROLL

INITIAL TYPE ROLL

STEELWORKERS

Also Manufacturers of INDUSTRIAL WEIGHING EQUIPMENT

Since 1881 THE WEBB® CORP.
WEBB CITY, MO., U. S. A.

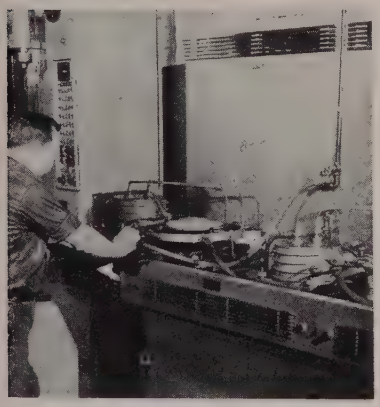
Hardening Rate Multiplies

Twister rolls hardening rate jumps to 35 per hour from 11 every 3½ hours

HARDENING of machinery parts has been stepped up more than 1000 per cent at Whitin Machine Works, Whitinsville, Mass., through the use of a new electronic induction heater installation.

According to Whitin engineers, the General Electric heater hardens bottom twister rolls at the rate of 35 an hour. Formerly the job was done by a cyanide furnace which took 3½ hours to harden 11 pieces.

Length: 40 Inches—The heater hardens various sized rolls up to almost 40 inches in length. Heat is applied exactly where needed, and controls on the front of the



TWO POSITIONS EMPLOYED
. . . fast change to second coil

panel easily adjust the cycle for the particular roll being hardened, the company reports.

On the heater table, next to the roll hardener, two positions are employed. While one piece is going through the hardening cycle, another part is set up on the other side. A transfer switch permits changing the heat from the first to the second coil, and while the new piece is being hardened, the first position is set up again.

Capacity, Range — The 50-kw heater, with three 20-kw units also at Whitin, handle more than 500 different parts. Mainly used for hardening, they also do annealing, silver soldering and soft soldering.

In addition to increasing production, the electronic induction heaters make the operators' job easier, the company says, because of the absence of gases and atmospheric heat and by facilitating parts handling.

High-Speed Tube System

Dial the correct number on a carrier and you can dispatch it—automatically—to any station at speeds up to 30 ft per second in an Airtube Automatic Switch system developed by Lamson Corp., Syracuse, N. Y.

No operator, central desk, or complicated circuits are required for this system which can service as many as 200 stations and will handle up to 600 carriers per hour. An operating full-size demonstrator has been installed in Lamson's New York Regional Office to show the system does its job rapidly and effectively. Paperwork, reports, test samples, and similar materials can be moved swiftly from one point to another by means of this latest development in pneumatic handling.

Fiske Darl Oil

The Base Cutting Oil that has FLEXIBILITY

FISKE'S "DARL" OIL can be used straight or reduced with mineral oil to the degree suitable for the tool, the work and the metal. That is FLEXIBILITY. "DARL" OIL works both ferrous and non-ferrous metals. It is non-corrosive, and permits visibility when mixed. Having exceptional anti-weld value, lubricity and high film strength, it is therefore excellent in drawing and stamping as well as for machining. Standardize with "DARL" and save money.

There is a Fiske Lubricant for every metal working operation. Each is an outstanding product and results in more production, better finish and increased tool life. Complete literature available. Write today to Fiske Brothers Refining Co., 123 Lockwood St., Newark 5, N. J., or 1504 Oakdale Avenue, Toledo 5, Ohio.

FISKE'S

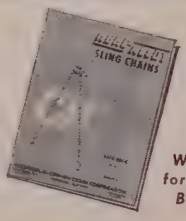
Established 1870

METAL WORKING LUBRICANTS

SPECIFY

HERC-ALLOY

SLING CHAINS



Write for Data Book

HERC-ALLOY Sling Chains are made-up to order, are individually tested, registered and guaranteed.

Hundreds of plants like the one shown above* are using Herc-Alloy Sling Chains. Greater safety is their big reason for doing it. But there are other factors too. Herc-Alloy is economical because of its long service life. Then too, the use of alloy steel permits a weight reduction that helps prevent worker fatigue. These advantages are worth thinking about. Those who do consider them seriously generally adopt safe Herc-Alloy Sling Chains for their plants.

*LAKE ERIE ENGINEERING CORPORATION — MANUFACTURER OF HYDRAULIC PRESSES

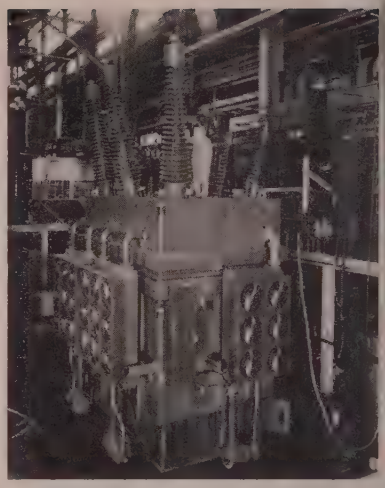
CM HOISTS AND CHAIN

COLUMBUS McKINNON

CHAIN CORPORATION

TONAWANDA, NEW YORK

DISTRICT OFFICES: NEW YORK, CHICAGO, CLEVELAND



Appalachian Expands

This 150,000-kva transformer made by Westinghouse for Appalachian Electric Power Co. is designed for 330 kv—one of the largest capacity transformers ever built for this high voltage. It is one of 12 such units now on order with Westinghouse for American Gas & Electric System. When installed, total weight will be 480,000 pounds

Track Repairs on the Spot

UNIQUE industrial housekeeper is Morrison Railway Supply Corp. For more than 25 years this firm has maintained switches, frogs and crossings for trunk, short line and large industrial yard railroads.

Standard practice before Morrison was to replace these fixtures when worn out with new ones, a costly procedure. Then in the mid-1920's this firm purchased the patent for reconditioning switching points and obtained a patent for the electric arc welding of alloy steel.

Mobile—Next Morrison succeeded in getting Interstate Commerce Commission to rescind its rule, which forbade welding of track under traffic.

As a result, the company now sends a specialist to examine work to be done. Within a short period of time a mobile unit arrives and the job is done on the spot.

Since many trunk lines are licensed to use the Morrison method of welding maintenance, short line railroads and industrial yard roads presently make up about 50 per cent of its business.

STANDARDS and SPECIALS by the Millions

THE FERRY CAP & SET SCREW CO.

2159 SCRANTON ROAD • • • CLEVELAND 13, OHIO

"SHINYHEADS"

America's Best Looking Cap Screw

Made of high carbon steel — AISI C-1038 — to standards for Full Finished hexagon head cap screws — bright finish. Heads machined top and bottom. Hexagon faces clean cut, smooth and true, mirror finish. Tensile strength 95,000-110,000 p.s.i. Carried in stock.

"HI-CARBS"

Heat Treated Black Satin Finish

Made of high carbon steel — AISI C-1038. Furnished with black satin finish due to double heat treatment. Hexagon heads die made, not machined. Points machine turned; flat and chamfered. Tensile strength 130,000-160,000 p.s.i. Carried in stock.

"LO-CARBS"

Made of AISI C-1018 steel—bright finish. For use where heat treatment is not required and where ordinary hexagon heads are satisfactory. Hexagon heads die made to size — not machined. Points machine turned. Tensile strength 75,000-95,000 p.s.i. Carried in stock.

SET SCREWS

Square head and headless — cup point. Case hardened. Expertly made by the pioneers in producing Cup Point Set Screws by the cold upset process. Cup points machine turned. Carried in stock.

FILLISTER CAP SCREWS

Heads completely machined top and bottom. Milled slots — less burrs. Flat and chamfered machined point. Carried in stock.

FLAT HEAD CAP SCREWS

Heads completely machined top and bottom. Milled slots — less burrs. Flat and chamfered machined point. Carried in stock.

"SHINYLAND" STUDS

All studs made steam-tight on tap end unless otherwise specified, with flat and chamfered machined point. Nut end, oval point. Land between threads shiny, bright, mirror finish. Carried in stock.

ADJUSTING SCREWS

Valve tappet adjusting screws — Hexagon head style — to blue print specifications—hexagon head hard; polished if specified — threads soft to close tolerance—points machine turned; flat and chamfered.

CONNECTING ROD BOLTS

Made of alloy steel—heat treated—threads rolled or cut — finished to extremely close thread and body tolerances — body ground where specified. Expertly made by the pioneers in producing connecting rod bolts by the cold upset process.

SPRING BOLTS

Case hardened to proper depth and ground to close tolerances. Thread end annealed. Supplied in various head shapes, with oil holes and grooves of different kinds, and flats accurately milled.

FERRY PATENTED ACORN NUTS

For ornamental purposes. Steel insert — steel covered. Finish: plain, zinc plated, cadmium plated. Size: 9/16", 3/4", 15/16" across the flats.

Tapped 1/4" to 3/4" inclusive. Cross section of Ferry patented acorn nut, showing how steel hexagon nut fits snugly into shell.

Pioneers and Recognized Specialists, Cold Upset Screw Products since 1907

STANDARDS carried by LEADING DISTRIBUTORS

* **SPECIALS** furnished to BLUE PRINT SPECIFICATIONS

WRITE FOR INFORMATION

SEND FOR SAMPLES

Johns-Manville announces the development of new **SIL-O-CEL 16L** *Insulating Fire Brick . . .*

Lompoc, California, where Johns-Manville mines and processes diatomaceous silica insulating materials

Combines outstanding physical and thermal properties for furnace service to 1600F

Check these properties of SIL-O-CEL 16L

Maximum service temperature	1600F, back-up or exposed
Approximate density	33-35 lb per cu ft
Transverse strength	60 psi
Cold crushing strength	350 psi
Linear shrinkage	0.7 percent at 1600F
Reversible thermal expansion	less than 0.1 percent at 1600F
Thermal conductivity (Btu in. per sq ft per F per hr at indicated mean temperatures)	0.92 at 500F 1.07 at 1000F 1.22 at 1500F

1—has less than 0.1% reversible thermal expansion at 1600F

2—provides high load-bearing strength

3—for direct exposure or back-up service

Here is a new development of Johns-Manville insulation and refractory research. Its exceptional characteristics provide important savings in furnace construction. Made of diatomaceous silica, Sil-O-Cel* 16L Insulating Brick is light in weight . . . has low thermal conductivity . . . high structural strength. And where furnace linings are subjected to severe heat shock or where high load-bearing properties are needed, Sil-O-Cel 16L offers outstanding performance.

Sil-O-Cel 16L is now available. Samples will be sent on request. Also available without obligation is Booklet IN-115A, which describes Sil-O-Cel 16L and other J-M Insulating Brick and Insulating Fire Brick for service to 3000F. Write Johns-Manville, Box 60, New York 16, N.Y. In Canada, 199 Bay Street, Toronto 1, Ontario.

*Sil-O-Cel is a Johns-Manville registered trade mark

Replaces SIL-O-CEL Natural Brick

The development of Sil-O-Cel 16L Insulating Brick has resulted in the discontinuance of Sil-O-Cel Natural Brick. The outstanding properties of Sil-O-Cel 16L make it the ideal replacement for Sil-O-Cel Natural Brick for back-up use. In addition, the properties of Sil-O-Cel 16L Brick extend its use to exposed service applications.

JM

Johns-Manville *FIRST IN* INSULATION

MATERIALS · ENGINEERING · APPLICATION

pecial Casting Delivery

tallation of a Towmotor LT-460 th revolving carriage and special nealing pot grab speeds cast ng de- ery 75 feet from cooling floor to akeout screen hopper. Eberhard g. Co. says it requires one man for e job and gets it done 15 per cent ster. Quick drops dislodge castings

MA Talks Personnel

Seven topics of immediate con- rn to personnel executives — as dicated by a survey of more than 00 personnel administrators in l parts of the United States—will discussed at the American Man- gement Association's national per- nnel conference to be held next onth.

At least 900 executives are ex- cted to attend the three-day eeting, scheduled for Sept. 28-30 Hotel Statler, New York.

What Problems—In planning the genda the A.M.A. surveyed more an 3,000 personnel executives om companies of every size and pe in all parts of the country to termine what problems were up- rmost in their minds and what uestions they wanted to hear an- vered.

As a result, topics of the confer- nce will include the strengthen- g of personnel administration, the namics of current labor relations, otivation of employees, changing ncepts of the personnel function, e application and administration industrial psychiatry, the status middle management personnel, nd the human problems that will ise in the automatic plant of e future.

✓ check the price
✓ check the analysis
✓ check the performance

and you'll specify

MUELLER BRASS CO.

tuf-stuf®

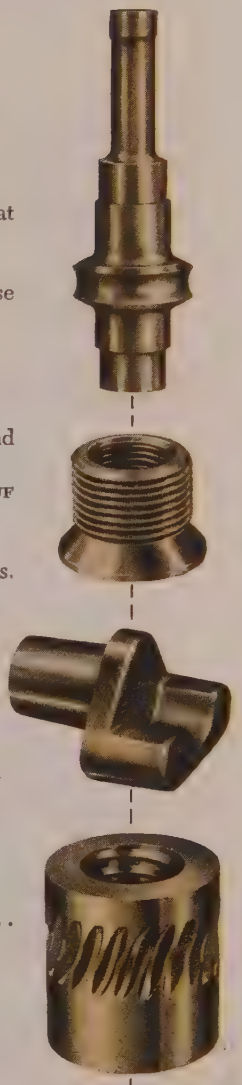
aluminum bronze

check the price—TUF-STUF, the Mueller Brass Co. series of aluminum bronze alloys, can be supplied at prices below those of similar alloys. Whether you buy TUF-STUF in rod shapes, forgings or screw machine products you'll save money because these alloys are priced right, machine better and last longer.

check the analysis—TUF-STUF alloys are a high copper base series containing from 9% to 13% aluminum and varying amounts of iron, nickel and manganese. They do not contain zinc and, therefore, are not subject to dezincification. TUF-STUF alloys are available in several grades with a chemical composition, suitable hardness and mechanical properties for many different applications.

check the performance—TUF-STUF alloys are light and strong—about 8% lighter than cast bronze and almost as strong as steel. They have a low coefficient of friction as well as good bearing and mechanical properties. They not only retain these properties but resist oxidation at the high speeds and high temperatures of modern production equipment. They will withstand strong acid attack or the effects of brackish waters and are highly resistant to corrosion.

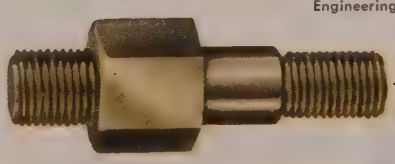
These alloys can be hot-forged into relatively intricate shapes . . . need little or no machining . . . and the smooth, bright surfaces eliminate costly finishing.



MUELLER BRASS CO.

PORT HURON 19, MICHIGAN

For complete information, write today for our new TUF-STUF Engineering Manual.



AIEE Tool Men Meet

Sixth Annual Conference on Machine Tools, sponsored by the subcommittee on machine tools of American Institute of Electrical Engineers, will be held in Cleveland, Oct. 14-16.

Program will include a series of technical papers and will provide up-to-date information on new products, processes and techniques as well as discussion of mutual problems in connection with standards, codes and safety regulations applicable to electrified machines.

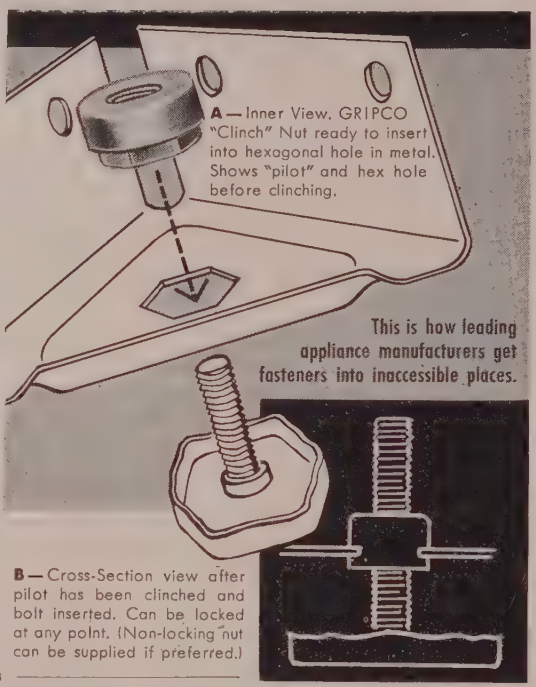
Plant tours are scheduled to Ford Motor Co.'s engine plant; Warner & Swasey Co.; Reliance Electric & Engineering Co.; and Chevrolet Motor Co.'s Cleveland transmission plant.

Guest speakers will be Frederick S. Blackall Jr., president, American Society of Mechanical Engineers and president of Taft-Peirce Mfg. Co.; and Louis B. Seltzer, editor, *Cleveland Press.*

ANY "BLIND" ASSEMBLIES?

Try "fixed" fastening with

GRIPCO "CLINCH" NUTS



A—Inner View. GRIPCO "Clinch" Nut ready to insert into hexagonal hole in metal. Shows "pilot" and hex hole before clinching.

This is how leading appliance manufacturers get fasteners into inaccessible places.

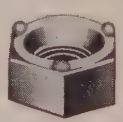
B—Cross-Section view after pilot has been clinched and bolt inserted. Can be locked at any point. (Non-locking nut can be supplied if preferred.)

The above typical application shows how GRIPCO "Clinch" Nuts are successfully used by famous makers of ranges and other appliances such as washers, dryers, refrigerators, freezers, room air conditioners, etc. In the example illustrated the GRIPCO "Clinch" Nuts serve a dual purpose; first, for crating, holding the product rigid in its container during shipment, with no possibility of bolts "backing out" and allowing the appliance to become damaged while shipping; and second, after installation, for holding the bolts which serve as feet that are adjustable for leveling.

Do you have any application on which fastening must be made from a hard-to-get-at point; or do you need additional threading depth for applying bolts to thin metals? Investigate this method of firmly affixing GRIPCO "Clinch" Nut to the work so it is already in position when bolt is applied.

Where Welding is Available—You may prefer to use

GRIPCO Pilot Projection Weld Nuts Circular pilot accurately positions nut in the bolt hole, for resistance welding. No jigs necessary. Two pilot heights for different gages of metal.

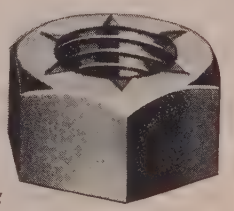


or GRIPCO Countersink Weld Nuts The special countersink feature eliminates the possibility of hot metal particles lodging in the threads; thus no retapping is necessary.

6-Point Security Against Fastener Failure

GRIPCO LOCK NUTS

1 —Firmly lock on to bolt at any position.
2 —Resist vibration, tension, etc.
3 —Positive locking action result of simple vertical thread deflection.
4 —Oil or water do not affect locking action.
5 —Can be removed with a wrench and reapplied repeatedly.
6 —Cost less because of simple design.



Write for samples, mentioning types and sizes of nuts you use.

GRIP **NUT COMPANY**

308-N S. Michigan Ave., Chicago 4, Ill. AD 357S

CALENDAR OF MEETINGS

September 13-16, Electrochemical Society Inc.: Fall meeting, Ocean Terrace hotel, Wrightsville Beach, N. Carolina. Society address: 216 W. 102nd St., New York 25. Secretary: Dr. Henry B. Linford.

September 13-16, American Institute of Chemical Engineers: Fall meeting, Hotel Fairmont, San Francisco. Institute address: 120 E. 41st St., New York 17. Secretary: Stephen L. Tyler.

September 14-15, American Machine Tool Distributors Association: Annual meeting, The Greenbrier, White Sulphur Springs, W. Va. Association address: 1900 Arch St., Philadelphia 3. Executive secretary: Thomas A. Fernley Jr.

September 14-15, American Hot Dip Galvanizers Association Inc.: Semi-annual meeting, Statler hotel, Cleveland. Association address: 1506 First National Bank Bldg., Pittsburgh 22. Secretary-treasurer: Stuart J. Swensson.

September 14-16, Allied Railway Supply Association: Annual meeting, Hotel Sherman, Chicago. Association address: 1200 W. Chase Ave., Chicago 26. Secretary: Charles F. Weil.

September 14-17, Society of Automotive Engineers Inc.: National tractor meeting and production forum, Hotel Schroeder, Milwaukee. Society address: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

September 14-18, Industrial Engineering Conference: Michigan State College, East Lansing, Mich. Information: James M. Apple, Dept. of Mechanical Engineering, Michigan State College, East Lansing, Mich.

September 16-18, Porcelain Enamel Institute: Shop practice forum, Ohio State University, Columbus, O. Institute address: 1346 Connecticut Ave., NW, Washington 6. Secretary: John C. Oliver.

September 17, Material Handling Institute: Closed meeting with Wayne University and Detroit Board of Commerce on control and management of major investments in material handling, Engineering Society of Detroit, Rackham Memorial. Institute address: 813 Clark Bldg., Pittsburgh 22. Managing director, R. Kennedy Hanson.

September 17-18, National Foundry Association: Annual meeting, Plaza hotel, New York. Association address: 53 W. Jackson Blvd., Chicago 4. Executive secretary: Charles T. Sheehan.

September 18, Wire Association: Nonferrous division's Waterbury regional meeting, Elton hotel, Waterbury, Conn. Association address: 453 Main St., Stamford, Conn. Executive secretary: Richard E. Brown.

September 18-19, American Ceramic Society: Refractories division meeting, Bedford Springs hotel, Bedford, Pa. Society address: 2525 N. High St., Columbus 2, O. General secretary: Charles S. Pearce.

September 20-23, National Metal Trades Association: Eastern plant management conference, Sagamore hotel, Lake George, N. Y. Association address: 122 S. Michigan Ave., Chicago 3. Commissioner: Charles L. Blatchford.

September 20-23, Packaging Machinery Manufacturers Institute: Annual meeting, Skytop Lodge, Skytop, Pa. Institute address: 342 Madison Ave., New York 17. Secretary-treasurer: Helen L. Stratton.

September 20-23, American Institute of Wholesale Plumbing & Heating Supply Associations Inc.: Annual convention, Hotel Waldorf-Astoria, New York. Institute address: 402 Albee Bldg., Washington. Executive secretary: George T. Underwood.

September 21, Cutting Tool Manufacturers Association: Fall meeting, Lochmoor Club, Detroit. Association address: 416 Penobscot Bldg., Detroit 26. Secretary: M. J. Ewald.

September 21-22, Steel Founders' Society of America: Fall meeting, The Homestead, Hot Springs, Va. Society address: 920 Midland Bldg., Cleveland. Secretary: F. Kermit Donaldson.

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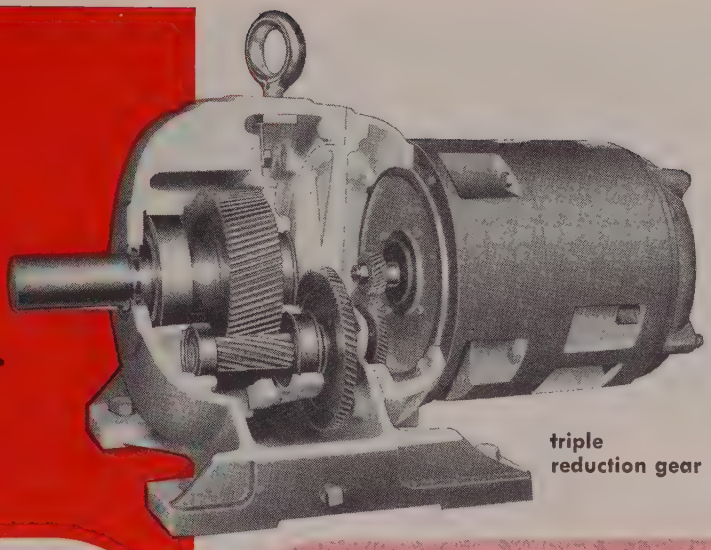

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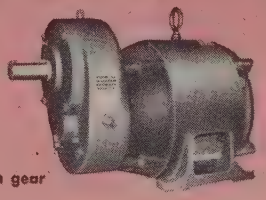

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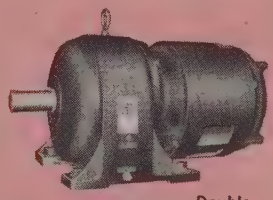
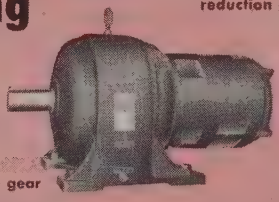


Double reduction gear



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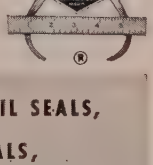

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RUBBER EXPANSION JOINTS

September 21-23, Truck Body & Equipment Association Inc.: Annual meeting, Sheraton-Gibson hotel, Cincinnati. Association address: 1122 DuPont Circle Bldg., Washington 6. Executive manager: Arthur J. Nuesse.

September 21-24, American Mining Congress: Annual metal and nonmetallic mineral mining convention, Olympic hotel, Seattle. Congress address: 1102 Ring Bldg., Washington 6. Executive vice president: Julian D. Conover.

September 21-25, Instrument Society of America: National instrument conference and exhibit, Hotels Morrison and Sherman, Chicago. Society address: 1319 Allegheny Ave., Pittsburgh. Manager: P. V. Jones Jr.

September 23-25, National Industrial Conference Board Inc.: General session for all associates on marketing, Hotel Waldorf-Astoria, New York. Board address: 247 Park Ave., New York 17. Secretary: Herbert S. Briggs.

September 23-26, National Association of Foremen: Annual convention, Milwaukee. Association address: 321 W. 1st St., Dayton 2, O.

September 24-27, American Refractories Institute: Fall meeting, Broadmoor hotel, Colorado Springs, Colo. Institute address: 1872 Railway Exchange Bldg., St. Louis 1. President: W. J. Westphalen.

September 25, Malleable Founders' Society: General meeting, Hotel Cleveland, Cleveland. Society address: 1800 Union Commerce Bldg. Cleveland 14. Managing director: Lowell D. Ryan.

September 28-30, American Management Association: Personnel conference, Hotel Statler, New York. Association address: 330 W. 42nd St., New York 36. President: Lawrence A. Appley.

September 28-30, National Electronics Conference Inc.: Annual conference and exhibition, Hotel Sherman, Chicago. Conference address: 852 E. 83rd St., Chicago. Executive secretary: Karl Kramer.

September 28-October 1, Association of Iron & Steel Engineers: Annual meeting, Hotel William Penn, Pittsburgh. Association address: 1010 Empire Bldg., Pittsburgh. Managing director: T. J. Ess.

September 29-October 3, Society of Automotive Engineers Inc.: National aeronautics meeting, aircraft engineering display and aircraft production forum, Hotel Statler, Los Angeles. Society address: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

September 30-October 2, Porcelain Enamel Institute: Annual meeting, The Greenbrier, White Sulphur Springs, W. Va. Institute address: 1346 Connecticut Ave., NW, Washington 6. Secretary: John C. Oliver.

September 30-October 3, National Association of Aluminum Distributors: Annual meeting, Broadmoor hotel, Colorado Springs, Colo. Association address: 1900 Arch St., Philadelphia 3. Secretary: R. Bruce Wall.

October 1, American Iron & Steel Institute: Youngstown regional technical meeting, Hotel Pick-Ohio, Youngstown. Institute address: 350 Fifth Ave., New York 1, Secretary: George S. Rose.

October 5-7, American Society of Mechanical Engineers: Fall meeting, Hotel Sheraton, Rochester, N. Y. Society address: 29 W. 39th St., New York 18. Secretary: C. E. Davies.

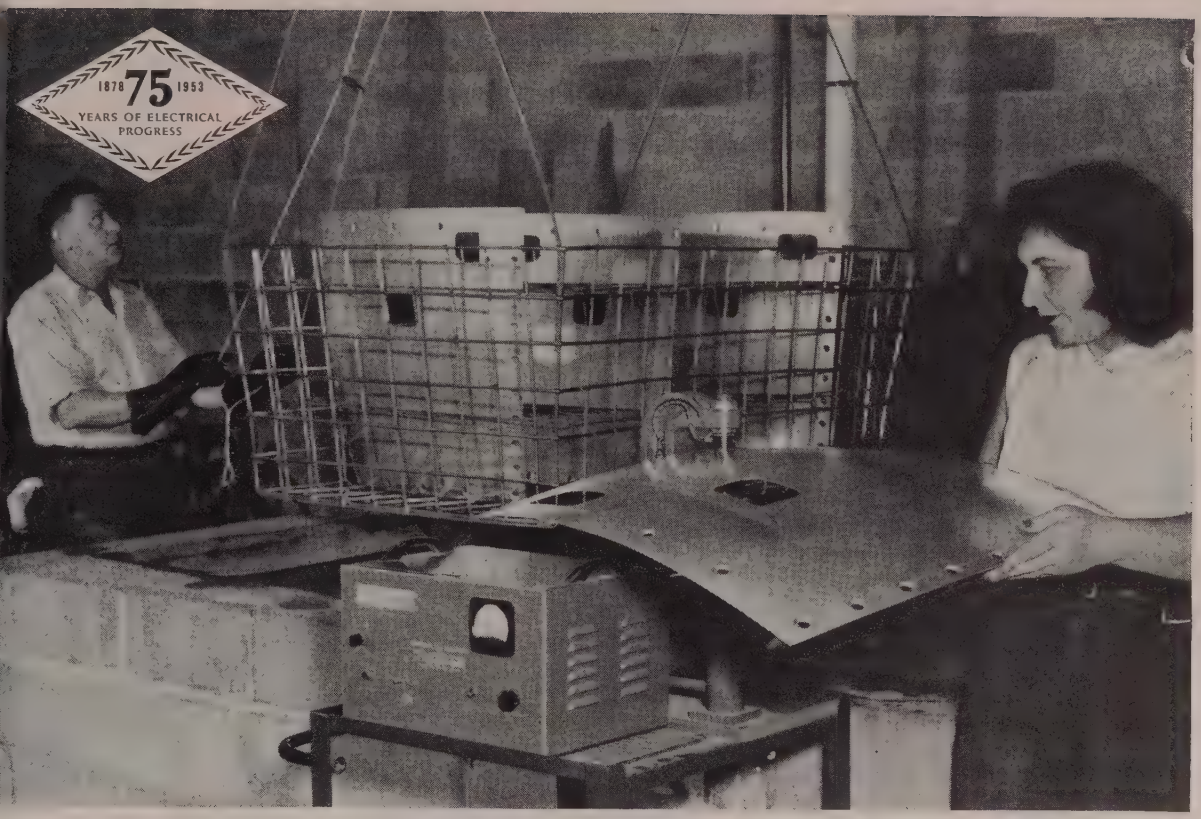
October 6-7, National Fluid Power Association: Fall meeting, Sheraton hotel, Chicago. Association address: 1618 Orrington Ave. Evanston, Ill. Executive secretary: Barrett Rogers.

October 7-9, National Association of Corrosion Engineers: South-central regional meeting, Mayo hotel, Tulsa, Okla. Association address: 1061 M & M Bldg., Houston 2. Executive secretary: A. B. Campbell.

October 7-10, Pressed Metal Institute: Annual meeting, Bellevue-Stratford hotel, Philadelphia. Institute address: 2860 E. 130th St. Cleveland 20. Managing director: Orrin E. Werntz.

October 8, American Iron & Steel Institute: Chicago regional technical meeting, Palmer House, Chicago. Institute address: 350 Fifth Ave., New York 1. Secretary: George S. Rose.

October 8, Rail Steel Bar Association: Fall meeting, Hotel Sheraton, St. Louis. Association address: 38 S. Dearborn St., Chicago 3. Secretary: W. H. Jacobs.



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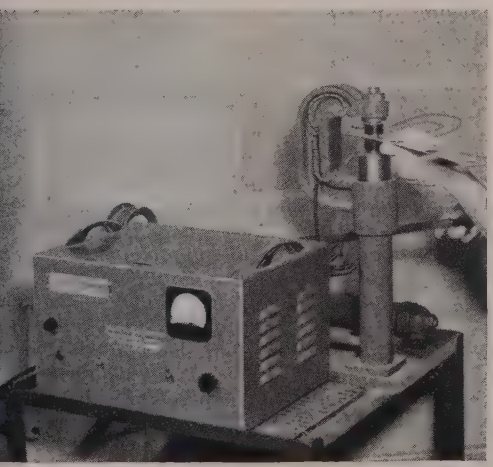
Guesswork taken out of welding preparation by G-E Surface Resistance Indicator



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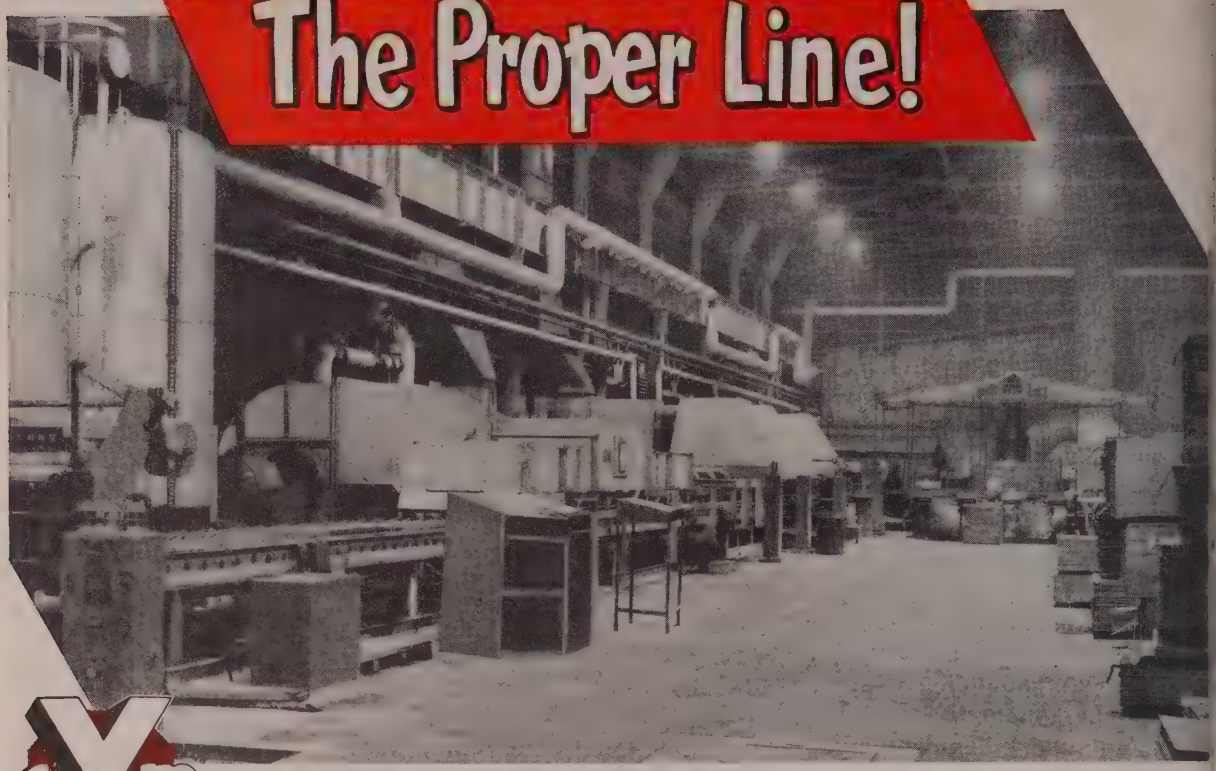

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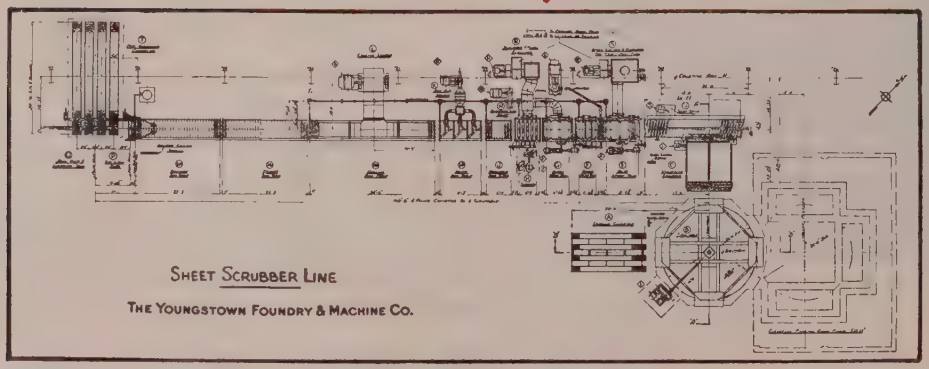

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New Books

Materials Text

TEXTBOOK OF THE MATERIALS OF ENGINEERING by Herbert F. Moore and Mark B. Moore; cloth, 372 pages, 9¼ x 6 inches; published by McGraw-Hill Book Co. Inc., New York, for $6.00; available from STEEL, Penton Bldg., Cleveland.

In this publication presentation is made of the properties of various materials, used for machine and structural parts, which affect strength, stiffness, ductility and resistance to corrosion or wear.

The coverage of these properties includes methods of production, such as casting and molding, and chemical and mechanical methods of strengthening materials: heat treating, alloying, hammering and rolling, and aging. The internal structures and processes producing various materials receive brief descriptions. Effectiveness of various treatments for structural or machine parts is demonstrated, along with the limiting stress, strain, or strain energy under which various metals function satisfactorily.

This edition offers information given by the electron microscope, a slight discussion of resistance to "fatigue" by metals under compressive loads, discussions of boron and titanium, and other special features.

Physics of Solids Survey

INTRODUCTION TO SOLID STATE PHYSICS by Charles Kittel; cloth, 396 pages, 9¼ x 5¾ inches; published by John Wiley & Sons Inc., New York, and Chapman & Hall Ltd., London, for $7.00; available from STEEL, Penton Bldg., Cleveland.

Designed for students in physics, chemistry, and engineering, this book provides an elementary and short account of representative aspects of the physics of solids. In keeping with the survey nature of his approach, Dr. Kittel emphasizes the theoretic models of solids and concentrates on those areas of the field which can be discussed in terms of simple, concrete and well-developed models. Dielectric and magnetic properties are therefore stressed.

Classification of solids and crystal structure, lattice energy of ionic crystals, elastic constants of crystals, lattice vibrations, thermal properties of solids, dielectric properties and ferroelectric crystals are among the topics covered. Other chapter headings include diamagnetism and paramagnetism, ferromagnetism and antiferromagnetism, superconductivity, free electron and band theory of models, semiconductors and imperfections in solids.

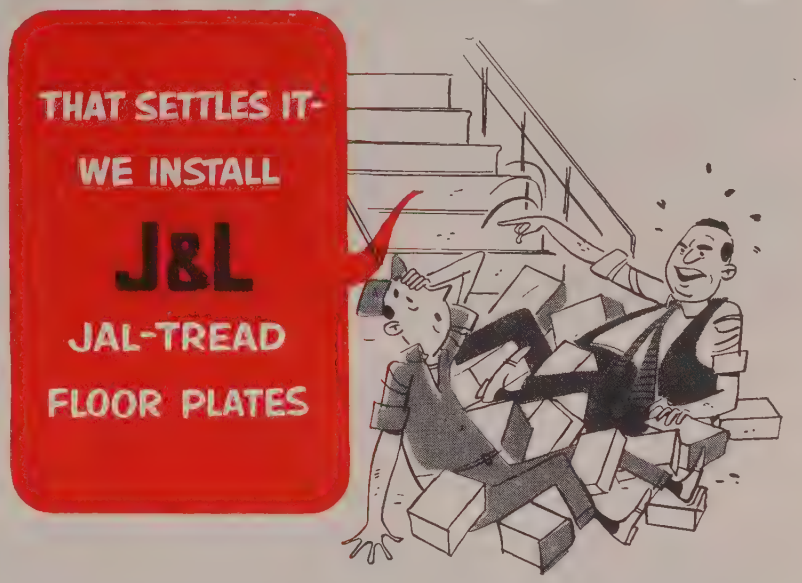
Welding Booklet

Bulletin A-93—44 pages, "The Welding of Nickel Alloy Steels," with tables, graphs and illustrations is a study of the various welding techniques, including some of the newer inert gas processes, electrodes, preheat treatments and post heat treatments.

Several of the typical results that can be expected are given for the low alloy high strength steels, low carbon and medium carbon engineering alloy steels, and special steels. International Nickel Co. Inc., New York 5, N. Y.

Refrigeration Manual Revised

A revised edition of their refrigeration manual has been published by The Trane Co., La Crosse, Wis., manufacturer of heating, air conditioning and ventilating equipment.



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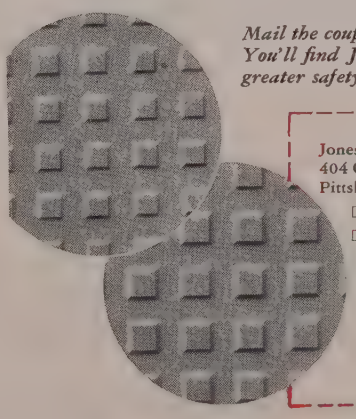

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Market Outlook

STEEL OUTPUT dropped last week to the lowest level in 13 months.

Responsible for the decline were a strike at Buffalo, lessened steel demand in the West and some other areas and the Labor Day holiday.

SLOWDOWN— Resultant national rate of production of steel for ingots and castings was 88.5 per cent of capacity. This is the lowest mark since August of last year when the steel industry was recovering from a general strike.

In the Buffalo district last week, production plunged 75 points to 31.5 per cent of capacity as a result of a strike that originated in the coke oven department of Bethlehem Steel Co.'s plant at Lackawanna.

NATURAL TENDENCY— Elsewhere, steel production tended to ease off in conjunction with a decrease in steel demand. When there isn't frenzy in demand for steel, producers are not inclined to push their production facilities to capacity limits. An outstanding case of where steel producers cut production to fit demand is in the West. Last week the composite operating rate for 17 far western mills fell 12.5 points to 90 per cent of capacity.

SPOTTY— While steel demand and production are down in some areas they are holding up well in others. Pinched the most are facilities that had been making conversion steel and other premium-priced steel, facilities making forms of steel that have been easing in demand for some time and facilities that are the least favorably located to consumers.

SOMETHING TO WATCH— If steel demand declines far enough that producers have to compete sharply for business, buyers will increasingly insist that mills absorb part or all of the freight charges. In most cases the consumer now pays the freight on steel from the mill to his plant. Mills in geographical areas where steel consumption exceeds productive capacity will be the last to feel any diminution of demand, and consequently they'll be the last to feel the pressure for freight absorption.

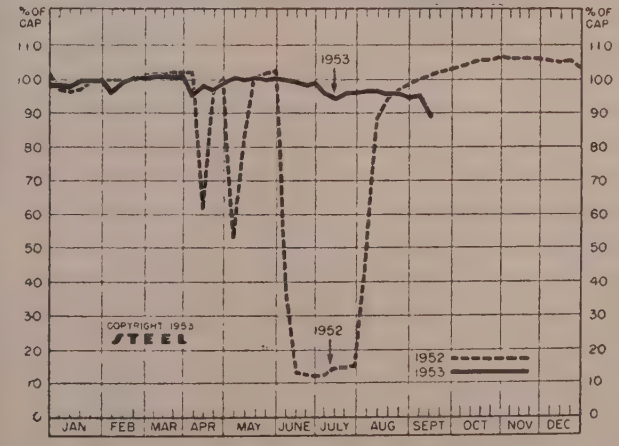
SHARPENING THE CUT— Increased availability of steel tends to sharpen the cut in buying to below the current rate of consumption. Users are inclined to live off their inventories and reduce them as far as possible. When you can get steel when you want it you're not apt to keep large stocks on hand. When these stocks are reduced there may be a spurt in buying.

Meanwhile, users and warehouses are increasingly selective in their ordering. Although extra tonnage is being offered warehouses they are interested only in popular items that would help put their stocks into balance.

DOWNWARD— Spearheading the return of competition to the steel market is the drop in the price of scrap—one of the principal raw materials for steelmaking. For the fourth consecutive week, scrap prices declined, and in the week ended Sept. 10 they lowered STEEL's arithmetical price composite on steelmaking grades to $38.67 from the preceding week's $40.50. The $38.67 figure is the lowest recorded since August, 1950.

Holding their own are prices of tin mill products for the new pricing period that will begin on Oct. 1. They are remaining unchanged because the increased price of steel in those products is offset by the reduced price of tin.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of capacity engaged at leading production points)

	Week Ended Sept. 12	Change	Same Week 1952	Same Week 1951
Pittsburgh	93	— 1*	98.5	98.5
Chicago	98.5	+ 1*	104	105
Mid-Atlantic	97.5	+ 0.5	98	98
Youngstown	105	— 1	106	106
Wheeling	96	0	95	95
Cleveland	99.5	— 3*	104.4	101
Buffalo	31.5	—75	104.5	104
Birmingham	97	0	100	100
New England	85	+ 2	85	90
Cincinnati	76.5	0	92	103
St Louis	84.5	—10.5	101	92.5
Detroit	104.5	— 5	105	104
Western	90	—12.5	100	99
Estimated National Rate	88.5	— 7	101	100

*Change from preceding week's revised rate. Weekly steelmaking capacity is estimated at 2,254,459 net tons in 1953; 2,077,040 tons in 1952; 1,999,034 tons in 1951.

The Metalworking Outlook—p. 55 Technical Outlook—p. 103

PRICE INDEXES AND COMPOSITES

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics) Week Ended Sept. 8

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them write to STEEL.

Rails, standard, No. 1	$4.400	Bars, H.R., alloy	$8.675	Strip, C.R., stainless, 430 (lb)	$0.415	Tin plate, hot-dipped, 1.25 lb	$8.433
Rails, light, 40 lb	5.767	Bars, H. R., stainless, 303 (lb)	0.418	Strip, H.R., carbon	5.113	Tin plate, electrolytic, 0.25 lb	7.133
Tie Plates	5.125	Bars, H.R., carbon	4.850	Pipe, black, buttweld (100 ft)	14.454	Black plate, can making quality	6.233
Axles, railway	7.250	Bars, reinforcing	4.775	Pipe, galv., buttweld (100 ft)	17.731	Wire, drawn, carbon	7.713
Wheels, freight car, 33 in. (per wheel)	47.000	Bars, C.F., carbon	7.860	Pipe, line (100 ft)	141.980	Wire, drawn, stainless, 430 (lb)	0.545
Plates, carbon	4.550	Bars, C.F., alloy	11.075	Casing, oil well, carbon (100 ft)	149.516	Bale ties (bundle)	5.653
Structural Shapes	4.333	Bars, C.F., stainless, 302 (lb)	0.433	Casing, oil well, alloy (100 ft)	214.113	Nails, wire, 8d common	7.530
Bars, tool steel, carbon (lb)	0.415	Sheets, H.R., carbon	4.765	Tubes, boiler (100 ft)	‡	Wire, barbed (80-rod spool)	6.847
Bars, tool steel, alloy, oil hardening die (lb)	0.505	Sheets, C.R., carbon	5.904	Tubing, mechanical, carbon (100 ft)	‡	Woven wire fence (20-rod roll)	16.174
Bars, tool steel, H.R. alloy, high speed W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.135	Sheets, galvanized	7.015	Tubing, mechanical, stainless, 304 (100 ft)	161.193		
Bars, tool steel, H.R. alloy, high speed W18, Cr 4, V 1 (lb)	1.730	Sheets, C.R., stainless, 302 (lb)	0.548				
		Sheets, electrical	9.183				
		Strip, C.R., carbon	7.371				

‡Not available.

FINISHED STEEL PRICE INDEX (Bureau of Labor Statistics)

	Sept. 8 1953	Sept. 1 1953	Month Ago	Aug. Average
(1947-1949=100)	141.7	141.7	141.7	141.7

STEEL's FINISHED STEEL PRICE INDEX

	Sept. 10 1953	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av.=100)	189.38	189.38	189.38	181.31	143.08
Index in cents per lb.	5.130	5.130	5.130	4.912	3.876

STEEL's ARITHMETICAL PRICE COMPOSITE*

	Sept. 10 1953	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Finished Steel, NT	$115.56	$115.56	$115.56	$110.98	$95.05
No. 2 Fdry, Pig Iron, GT.	56.54	56.54	56.54	55.04	44.30
Basic Pig Iron, GT	56.04	56.04	56.04	54.66	43.86
Malleable Pig Iron, GT.	57.27	57.27	57.27	55.77	44.68
Steelmaking Scrap, GT.	38.67	40.50	44.17	43.00	43.33

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

COMPARISON OF PRICES

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	Sept. 10 1953	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	4.15	4.15	4.15	3.95	3.45
Bars, H.R., Chicago	4.15	4.15	4.15	3.95	3.35
Bars, H.R., del. Philadelphia	5.302	5.302	5.302	4.502	3.79
Bars, C.F., Pittsburgh	5.20	5.20	5.20	4.925	3.95
Shapes, Std., Pittsburgh	4.10	4.10	4.10	3.85	3.25
Shapes, Std., Chicago	4.10	4.10	4.10	3.85	3.25
Shapes, delď., Philadelphia.	4.38	4.38	4.38	4.13	3.48
Plates, Pittsburgh	4.10	4.10	4.10	3.90	3.50
Plates, Chicago	4.10	4.10	4.10	3.90	3.40
Plates, Coatesville, Pa.	4.35	4.35	4.35	4.35	3.75
Plates, Sparrows Point, Md.	4.10	4.10	4.10	3.90	3.45
Plates, Claymont, Del.	4.55	4.55	4.55	4.35	3.95
Sheets, H.R., Pittsburgh	3.925	3.925	3.925	3.775	3.275
Sheets, H.R., Chicago	3.925	3.925	3.925	3.775	3.25
Sheets, C.R., Pittsburgh	4.775	4.775	4.775	4.575	4.00
Sheets, C.R., Chicago	4.775	4.775	4.775	4.575	4.00
Sheets, C.R., Detroit	4.975	4.975	4.975	4.775	4.20
Sheets, Galv., Pittsburgh	5.275	5.275	5.275	5.075	4.40
Strip, H.R., Pitts.	3.975-4.425	3.975-4.425	3.975-4.425	3.75-4.225	3.275
Strip, H.R., Chicago	3.925	3.925	3.925	3.725	3.275
Strip, C.R., Pittsburgh	5.45-5.95	5.45-5.95	5.45-5.95	5.10-5.80	4.00
Strip, C.R., Chicago	5.70	5.70	5.70	5.35	4.125
Strip, C.R., Detroit	5.45-6.05	5.45-6.05	5.45-6.05	5.30-6.05	4.20
Wire, Basic, Pitts.	5.475-5.525	5.475-5.525	5.475-5.525	5.10-5.225	4.15
Nails, Wire, Pittsburgh	6.35-6.55	6.35-6.55	6.35-6.55	6.20-6.35	5.15
Tin plate (1.50 lb), box, Pitts.	$8.95	$8.95	$8.95	$8.95	$6.70

SEMIFINISHED STEEL					
Billets, forging, Pitts. (NT)	$75.50	$75.50	$75.50	$70.50	$61.00
Wire rods, ⅜-⅝", Pitts.	4.525	4.525	4.525	4.325	3.45

PIG IRON, Gross Ton	Sept. 10 1953	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bessemer, Pitts.	$57.00	$57.00	$57.00	$55.50	$47.00
Basic, Valley	56.00	56.00	56.00	54.50	43.00
Basic, deld. Phila.	60.75	60.75	60.75	59.25	46.17
No. 2 Fdry, Pitts.	56.50	56.50	56.50	55.00	46.50
No. 2 Fdry, Chicago	56.50	56.50	56.50	55.00	43.25
No. 2 Fdry, Valley	56.50	56.50	56.50	55.00	43.50
No. 2 Fdry, deld. Phila.	61.25	61.25	61.25	59.75	46.67
No. 2 Fdry, Birm.	52.88	52.88	52.88	51.38	43.38
No. 2 Fdry (Birm.) del. Cin.	60.43	60.43	60.43	58.93	49.09
Malleable, Valley	56.50	56.50	56.50	55.00	43.50
Malleable, Chicago	56.50	56.50	56.50	55.00	43.50
Ferromanganese, Duquesne	200.00†	200.00†	200.00†	228.00*	143.00*

*78-82% Mn, per gross ton, Etna, Pa. †74-76% Mn, per net ton.

SCRAP, Gross Ton (Including broker's commission)					
No. 1 Heavy Melt, Pitts.	$41.50	$42.50	$45.50	$44.00	$42.75
No. 1 Heavy Melt, E. Pa.	39.00	41.50	43.50	41.50	45.50
No. 1 Heavy Melt, Chicago	35.50	31.50	43.50	42.50	41.75
No. 1 Heavy Melt, Valley	39.50	42.50	45.50	44.00	42.75
No. 1 Heavy Melt, Cleve.	35.50	40.50	44.50	43.00	42.25
No. 1 Heavy Melt, Buffalo.	41.50	41.50	43.75	43.00	46.25
Rails, Rerolling, Chicago	52.00	54.00	57.50	52.50	63.25
No. 1 Cast, Chicago	35.00	38.00	42.00	48.50	70.00

COKE, Net Ton					
Beehive, Furn, Connisvl.	$14.75	$14.75	$14.75	$14.75	$14.25
Beehive, Fdry, Connisvl.	16.75	16.75	16.75	17.00	17.00
Oven Fdry, Chicago	24.50	24.50	24.50	23.00	20.40

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

PRIMARY METALS AND ALLOYS

Aluminum: 99% plus, ingots 21.50, pigs 20.00, 10,000 lbs or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 12% Si, 23.30; No. 43, 5% Si, 23.10; No. 142, 4% Cu, 24.40; No. 195, 4.5% Cu, 0.8% Si, 23.70; No. 214, 3.8% Mg, 24.40; No. 356, 7% Si, 0.3% Mg, 23.20.

Antimony: R.M.M. brand, 99.5% 34.50, Lone Star brand, 35.00, f.o.b. Laredo, Texas, in bulk. Foreign brands, 99.5%, 25.50-26.00 New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $72.75 per lb of contained Be, f.o.b. Reading, Pa.

Beryllium Copper: 3.75-4.25% Be, $40.00 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. Reading, Pa. or Elmore, O.

DAILY NONFERROUS PRICE RECORD

	Price Sept. 10	Last Change	Previous Price	Aug. Avg.	July Avg.	Aug., 1952 Avg.
Copper	29.00-30.00	Aug. 19	28.50-30.00	29.375	29.846	24.500
Lead	13.80	July 23	13.55	13.800	13.483	15.800
Zinc	10.50	Sept. 2	11.00	11.000	11.000	14.067
Tin	83.00	Sept. 8	82.75	80.530	81.577	121.500
Nickel	60.00	Jan. 14	56.50	60.000	60.000	56.500
Aluminum	21.50	July 15	20.50	21.500	20.923	19.923
Magnesium	27.00	Mar. 9	24.50	27.000	27.000	24.500

Quotations in cents per pound based on: Copper, deld. Conn. Valley; Lead, common grade, deld. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, deld. New York; Nickel, electrolytic cathodes, 99.9%, base size at refinery unpacked; Aluminum, primary ingots, 99% plus, deld.; Magnesium, 99.8%, Freeport, Tex.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $2.00 per lb deld.

Cobalt: 97-99%, $2.40 per lb for 550 lb keg; $2.42 per lb for 100 lb case; $2.47 per lb under 100 lb.

Columbium: Powder, $75.00 per lb, nom.

Copper: Electrolytic 29.00-30.00 deld. Conn. Valley, 29.125-30.125 deld. Midwest; Lake 30.125 deld.; Fire refined 29.75 deld.

Germanium: 99.9%, $350.00 per lb nom.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $165-$175 per troy oz.

Lead: Common 13.80, chemical 13.90, corroding 13.90, St. Louis. New York basis, add 0.20.

Lithium: 98%, $10-$13 per lb, depending on quantity.

Magnesium: 99.8% standard ingots 27.00, 10,000 lb or more, f.o.b. Freeport, Tex. Sticks, 1.3 in. dia., 45.00, 100 to 4999 lb.

Magnesium Alloys: AZ91B 30.50; AZ91C and alloys C, H, G and R 32.50; alloy M 34.50, 10,000 lb or more.

ercury: Open market, spot, New York, 38-$191 per 76-lb flask.

olybdenum: Powder, 99% hydrogen reduced .40 per lb; pressed ingot $4.06 per lb; ttered ingot $5.53 per lb.

ckel: Electrolytic cathodes, sheets (4 x 4 in. d larger), unpacked, 60.00; 25-lb pigs 62.65; "X" nickel shot 63.65; "F" nickel shot or ots, for addition to cast iron 60.00; prices .b. Port Colborne, Ont., including import ty. New York basis, add 0.92.

mium: $140-$150 per troy oz. nom.

alladium: $23-$24 per troy oz.

atinum: $91-$93 per troy oz. from refineries.

adium: $16.00-$21.50 per mg. radium content, pending on quantity.

odium: $125 per troy oz.

uthenium: $80-$85 per troy oz.

elenium: 99.5%, $4.25-$4.75 per lb.

dium: 16.50, carlots; 17.00 l.c.l.

antalum: Sheet, rod $42.45 per lb; powder 3.50 per lb.

ellurium: $1.75 per lb.

hallium: $12.50 per lb.

n: Straits, New York, 83.00.

ngsten Powder: 98.8%, carbon reduced, 1000 lots $5.35 per lb deld.; less than 1000 lb .50; 99% plus hydrogen reduced $6.40. reated ingots $10.43 per lb.

c: Price western 10.50, brass special 10.75, termediate 11.00, E. St. Louis, freight owed over 0.50 per pound. High grade .85, special high grade 12.00, die casting oy ingot 15.00, deld.

rconium: Sponge $14.00 per lb; powder 100 or more $7.00; less than 100 lb $8.00.

Note: Chromium, manganese and silicon met- s are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

uminum Ingot: Piston alloys 22.50-23.00; o. 12 foundry alloy (No. 2 grade) 21.75-.50; 5% silicon alloy, 0.60 Cu max., 24.00-.75; 13 alloy, 0.60 Cu max., 24.00-24.75; .5 alloy 22.50-24.00; 108 alloy 22.50-23.00; eel deoxidizing grades, notch bars, granu- ted or shot: Grade 1, 23.75-24.00; grade 2, .50-23.00; grade 3, 21.50-22.00; grade 4, .50-21.00.

ass Ingot: Red brass, No. 115, 24.50; tin onze, No. 225, 35.25, No. 245, 29.50; high- ded tin bronze, No. 305, 28.75; No. 1 llow, No. 405, 20.75; manganese bronze No. 1, 25.25.

agnesium Alloy Ingot: AZ63A, 31.50; AZ91B, .50; AZ91C, 32.00; AZ92A, 31.50.

NONFERROUS MILL PRODUCTS

COPPER WIRE

are, soft, f.o.b. eastern mills, 100,000 lb lots, .36; 30,000 lb lots, 35.48; l.c.l. 35.98. Weath- proof, 100,000 lb. 36.28; 30,000 lb. 36.53; .l., 37.03. Magnet wire deld., 15,000 lb or ore 41.83; l.c.l., 42.58.

LEAD

Prices to jobbers f.o.b. Buffalo, Cleveland, ttsburgh.) Sheets, full rolls, 140 sq ft or ore $19 per cwt; pipe, full coils $19 per rt; traps and bends, list prices plus 30%.

TITANIUM

Prices per lb, 10,000 lb and over, f.o.b mill) heets, $15; sheared mill plate, $12; strip, $15; re, $10; forging billets, $6; hot-rolled and rged bars, $6.

ZINC

heets 23.00, f.o.b. mill, 36,000 lb and over. ibbon zinc in coils, 19.50-20.50, f.o.b. mill, ,000 lb and over. Plates 19.50-20.75.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
heet, C.R. ..	86.5	67.5	92.5
rip, C.R. ...	92.5	70.5	98.5
ate, H.R. ..	84.5	66.5	90.5
od, Shapes ..	82.5	65.5	88.5
eamless Tubes	115.5	100.5	137.5
ot, Blocks...	....	60.0	....

ALUMINUM

(30,000 lb base; freight allowed on 500 lb or more.)

Sheets and Circles: 2S and 3S mill finish c.l.c.

Thickness Range Inches	Widths or Diameters, Inc.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	33.9	...	...
0.135-0.096	12-48	34.4	...	...
0.095-0.077	12-48	35.1	32.7	37.5
0.076-0.061	12-48	35.7	32.9	37.7
0.060-0.048	12-48	36.1	33.2	38.1
0.047-0.038	12-48	36.6	33.6	38.4
0.037-0.030	12-48	37.0	34.0	39.1
0.029-0.024	12-48	37.6	34.3	39.6
0.023-0.019	12-36	38.3	35.1	40.4
0.018-0.017	12-36	39.1	35.7	41.3
0.016-0.015	12-36	40.0	36.5	42.5
0.014	12-24	41.0	37.5	43.8
0.013-0.012	12-24	42.1	38.2	44.8
0.011	12-24	43.1	39.4	46.4
0.010-0.0095	12-24	44.3	40.5	48.0
0.009-0.0085	12-24	45.6	41.9	50.0
0.008-0.0075	12-24	47.1	43.1	51.8
0.007	12-18	48.6	44.6	54.1
0.006	12-18	50.2	46.0	59.1

* Lengths 72 to 180 inches. † Maximum diameter, 26 inches.

ALUMINUM

Plates and Circles: Thickness 0.250-3 in., widths or diameters 24-60 in., lengths 72-240 in.

Alloy	Plate Base	Circle Base
2S-F, 3S-F	32.4	36.3
50S-F	33.5	37.4
4S-F	34.5	39.1
52S-F	36.2	40.9
61S-T6	37.4	41.5
24S-T4*	39.3	45.4
75S-T6*	47.1	53.7

* Widths or diameters 24-48 in., lengths 72-180 in.

ALUMINUM

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or distance across flats	Round 11S-T3	Round 17S-T4	Hexagonal 11S-T3	Hexagonal 17S-T4
Drawn				
0.125	59.6	57.9	...	...
0.156-0.172	50.6	48.9	...	...
0.188	50.6	48.9	...	62.4
0.219-0.234	47.9	46.2	...	...
0.250-0.281	47.9	46.2	...	59.5
0.313	47.9	46.2	...	56.8
Cold-finished				
0.375-0.531	46.6	44.9	56.2	53.4
0.563-0.688	46.6	44.9	53.4	50.2
0.750-1.000	45.5	43.8	48.9	47.3
1.063	45.5	43.8	...	45.7
1.125-1.500	43.8	42.1	47.3	45.7
Rolled				
1.563	42.7	41.0	...	...
1.625-2.000	42.1	40.4	...	44.1
2.125-2.500	41.1	39.4	...	...
2.750-3.375	39.9	38.2	...	...

ALUMINUM

Forging Stock: Round, Class 1, 42.05-32.76, in specific lengths 36-144 in., diameters 0.375-8 in.; rectangles and squares, Class 1, 49.2 to 37.6 in random lengths 0.375-4 in. thick, widths 0.750-10 in.

Industrial Roofing Sheet (0.032-in. thick): Flat, 42.75 in. wide, lengths 60-144 in., $2.838 to $6.816 per sheet. Corrugated, 35 in. wide, lengths 60-144 in., $2.862 to $6.874 per sheet.

MAGNESIUM

Sheet: AZ31, commercial grade. 0.032-in. 108.00, 0.064-in. 81.00, 0.125-in. 71.00, 30,000 lb and over, f.o.b. mill.

Plate: Hot-rolled, AZ31, 53.00, 20,000 lb or more 0.188-1 in. thick, widths to 48 in., lengths to 144 in.; raised pattern floor plate, 69.00, 20,000 lb or more, ¼-in. thick, widths 24-48 in., lengths 60-144 in.

Extrusion Stock: AZ31, Rectangles, ¼ x 2 in. 69.20, 1 x 4 in. 63.00. Rod, 1 in. 66.00, 2 in. 62.50. Tubing, 1 in. OD x 0.065-in. 87.00. Angles, 1 x 1 x ⅛-in. 72.90, 2 x 2 x ¼-in. 67.00. Channels, 5 in. 67.80. I-Beams, 5 in. 66.20

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tube	Clean Heavy	Rod Ends	Clean Turnings
Copper	48.38b	45.98c	....	48.44	26.000	26.000	25.250
Yellow Brass	41.72	41.66	42.26	44.63	19.750	19.500	18.000
Red Brass, 85%	45.44	45.38	45.98	48.25	23.000	22.750	22.250
Low Brass, 80%	44.47	44.41	45.01	47.28	22.125	21.875	21.375
Naval Brass	45.76	40.07	52.80	48.92	18.250	18.000	17.500
Commercial Bronze, 90%	46.95	46.89	47.49	49.51	23.875	23.625	23.125
Nickel Silver, 10%	55.36	N.A.	N.A.	....	23.625	23.375	11.813
Phosphor Bronze, A, 5%	66.58	67.08	67.08	68.23	26.125	25.875	24.875
Silicon Bronze	52.71	51.90	52.75	70.11e	25.125	24.875	24.125
Manganese Bronze	49.48	43.62	N.A.	....	18.250	18.000	17.500
Muntz Metal	43.96	39.77	....	....	18.625	18.375	17.375

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 pounds, f.o.b. shipping oint. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. N.A. ew price not posted as yet.

NONFERROUS SCRAP

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Aluminum: 2S clipping 13.00; low copper clippings 10.00, mixed clippings 10.00; old sheet 9.00; borings and turnings 6.50; pistons and struts 6.50; crankcases 9.00; industrial castings 9.00

Copper and Brass: Heavy copper and wire, No. 1 21.00; No. 2 copper 18.50-19.50; light copper 16.50; No. 1 composition red brass 15.00; No. 1 composition turnings 14.50; mixed brass turnings 9.00; new brass clippings 18.50 nom.; No. 1 brass rod turnings 13.00 nom.; light brass 9.00; heavy yellow brass 11.00; new brass rod ends 17.50 nom.; auto radiators, unsweated 11.00; cocks and faucets 13.00; brass pipe 14.50.

Lead: Heavy 10.00-11.00; battery plate 6.00-6.25; linotype and stereotype 12.25; electrotype 11.50; mixed babbitt 12.50.

Magnesium: Clippings 20.00-21.00; clean castings 19.00-20.00; iron castings, not over 10% removable Fe, 18.00-19.00.

Monel: Clippings 28.00-30.00; old sheet 26.00-27.00; turnings 19.00-21.00; rods 28.00-30.00.

Nickel: Sheets and clips 80.00; rolled anodes 80.00; turnings 50.00; rod ends 80.00.

Tin: No. 1 pewter 40.00-45.00; block tin pipe 65.00-67.00; No. 1 babbitt 37.00-38.00.

Zinc: Old zinc, 4.00; new die cast scrap, 4.00; old die cast scrap, 3.00.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 2S, 3S clippings 15.00-15.50; 51S, 52S clippings 15.00-15.50; 14S, 17S, 24S, clippings 14.00-14.50; mixed clippings 14.00-14.50; old sheet 12.50-13.00; old cast 12.50-13.00; clean old cable, free of steel 14.50-15.50; borings and turnings 13.00-13.50.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 42.00; light scrap 37.00.

Copper, Brass: No. 1 copper 23.00; No. 2 copper 21.50; light copper 20.00; refinery brass (60% copper) per dry copper content 18.50; auto radiators nom.

INGOT MAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper, Brass: No. 1 copper 23.00-23.50; No. 2 copper 21.50; light copper 20.00; No. 1 composition borings 16.50; No. 1 composition solids 17.25; heavy yellow brass solids 18.00; yellow brass turnings 12.25; radiators 13.00.

PLATING MATERIALS

(F.o.b. shipping points, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes $2.15 per lb.

Copper: Flat-rolled 47.14, oval 46.64, base prices; electrodeposited 38.38, carload lots; cast 44.14, ton lots.

Nickel: Depolarized, less than 500 lb 92.00; 500-4999 lb 88.00; over 5000 lb 86.00.

Tin: Bar or slab, less than 200 lb $1.015; 200-499 lb $1; 500-999 lb 99.50; 1000 lb or more 99.

Zinc: Bar 20.00, bar or flat top 19.00, ton lots.

CHEMICALS

Cadmium Oxide: $2.15 per lb, in 100 lb drums.
Chromic Acid: Less than 2000 lb 29.00; over 2000 lb 28.75.

Copper Cyanide: Under 1000 lb 63.90, 1000 lb and over 61.90.

Copper Sulfate: 100-6000 lb 11.35; 6000-12,000 lb 11.10; 12,000-24,000 lb 10.85; 24,000-36,000 lb 10.60; 36,000 lb and over 10.35.

Nickel Chloride: 100 lb 45.00; 200 lb 43.00; 300 lb 42.00; 400-4900 lb 40.00; 5000-9900 lb 38.00; 10,000 lb and over 37.00.

Nickel Sulfate: 100 lb 37.00; 200 lb 35.00; 300 lb 34.00; 400-4900 lb 32.00; 5000-35,900 lb 30.00; 36,000 lb and over 29.00.

Silver Cyanide: Cents per ounce, 16 oz 80,625; 100 oz 78.500; 2500 oz and over 77 375.

Sodium Cyanide: Egg, under 1000 lb 19.80. 1000-19,900 lb 18.80, 20,000 lb and over 17.80; granular, add 1.0 premium to above.

Sodium Stannate: Less than 100 lb 66.20; 100-600 lb 52.40; 700-1900 lb 49.80; 2000-9900 lb 48.10; 10,000 lb or more 47.

Stannous Chloride (Anhydrous): Less than 50 lb $1.509, 50 lb $1.169; 100-300 lb $1.019; 400-900 lb 99.40; 1000-1900 lb 97; 2000-4900 lb 93.30; 5000-19,000 lb 87.20; 20,000 lb and over 81.10.

Stannous Sulfate: Less than 50 lb $1.211; 50 lb 91.10; 100-1900 lb 89.10; 2000 lb and over 87.10.

Zinc Cyanide: Under 1000 lb 54.30, 1000 lb and over 52.30.

Nonferrous Metals

Easier procurement of nonferrous metals appears certain for the fourth quarter. Only nickel and a few aluminum products will give purchasing agents trouble

FOURTH QUARTER is shaping up as a picnic for purchasing agents.

Metals procurement in the October-December period promises to be easier than it's been in the last dozen quarters. Only a handful of scarce materials will give the PAs trouble, chiefly nickel and a few aluminum products among major nonferrous metals. Completing the transition into a full buyers' market will be the continued slow downtrend in nonferrous prices.

Copper Poised — Queasiness in copper has persisted all summer. Chief support to the price today is palaver over buying Chilean copper for stockpile. Estimates of unsold metal there have now swollen to 100,000 tons.

When Chilean metal comes back into the market and competition develops for customers, the price break is sure to come. Various estimates of year end level range from 20 to 27 cents, with the average around 24 cents. Brass mill products are now uniform on lower levels but further cuts will come when copper hits the skids. Mill business is good by normal standards but backed-up demand is now sated. Brass and bronze ingot business can be summed up in one word: Bad.

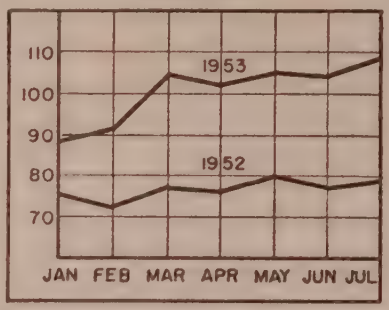
Aluminum, Too — Even aluminum will be easier to find in the fourth quarter. Some products are softer now and buying in general won't be as hectic as it has been, though the market is generally strong and prices stable.

Magnesium will continue free and easy with stock delivery in most fabricated products possible. A downward price revision would spur demand but there are no signs of its coming as yet.

Misery Twins—Lead and zinc will be more than plentiful for the rest of the year. Lead can be purchased on the commodity exchange or from abroad at a sizable discount from the New York spot price of 14 cents. Lead consumption this year has been strong, but there's just too much metal around. Secondary producers see the fourth quarter as "just fair." They've had an extra-good first eight months. Scrap market today is dead as smelters have backed away from excessive intake by posting a $65-and-higher smelting charge.

There's no telling when the slide in zinc will stop. Imports still shade the recently-lowered price. Stocks of zinc at the beginning of September totaled 117,897 tons, up about 14,000 tons in the month and highest in years. Production of 83,241 tons in August was high for the year to date, but shipments of 65,450 tons were lowest since July, 1952.

U.S. Primary Aluminum Production
Short Tons



Source: United States Department of the Interior, Bureau of Mines

Tin will be lower by year end, say market men. Some see another sharp slump, perhaps to 60 cents. Price stability in the past two weeks has been uneasy.

Nickel Decision Hangs Fire

Nickel users are still on tenterhooks, waiting for the much-delayed decision on decontrol, which last week was still expected "any day now." Defense department wants controls to remain, or decontrol pushed back to assure supplies adequate to take care of all military and AEC uses plus present stockpile requirements. NPA and industry recommend an Oct. 1 abolishment of M-80 and its remaining appendages, Schedules 1 and 1-A which relate to nickel and Schedule 5 which controls columbium and tantalum. Industry men see no need to keep controls on columbium and tantalum either. The three metals will go out together.

While there won't be sufficient nickel to take care of all civilian needs immediately, industry wants to handle its own business and feels that civilian demands would be smoothed over in a few months. The argument "controls breed more shortage" is substantiated, say industry men, by the fact that no shortages have shown up in decontrolled metals. Unless a decision is reached this week in Washington, target date will likely be pushed back to Nov. 1, both to appease the military and because steel works' October melt schedules generally close Sept. 15.

Wire and Cable Ride High

Wire and cable makers look for continued good business ahead as they ride the electric power boom. Softness in copper has caused customers to keep inventories low. In some sizes of wire, wholesalers are overstocked causing some order cancellations and two price cuts on building wire in the past month. Commercial construction and industrial use have bolstered the market, but smaller sizes of wire are on the downgrade with residential construction. Deliveries are available from stock in some wire, with late delivery on even the large sizes only 6 to 8 weeks on an average. Copper wire prices will sink as raw copper goes down.

Scovill Markets Aluminum Strip

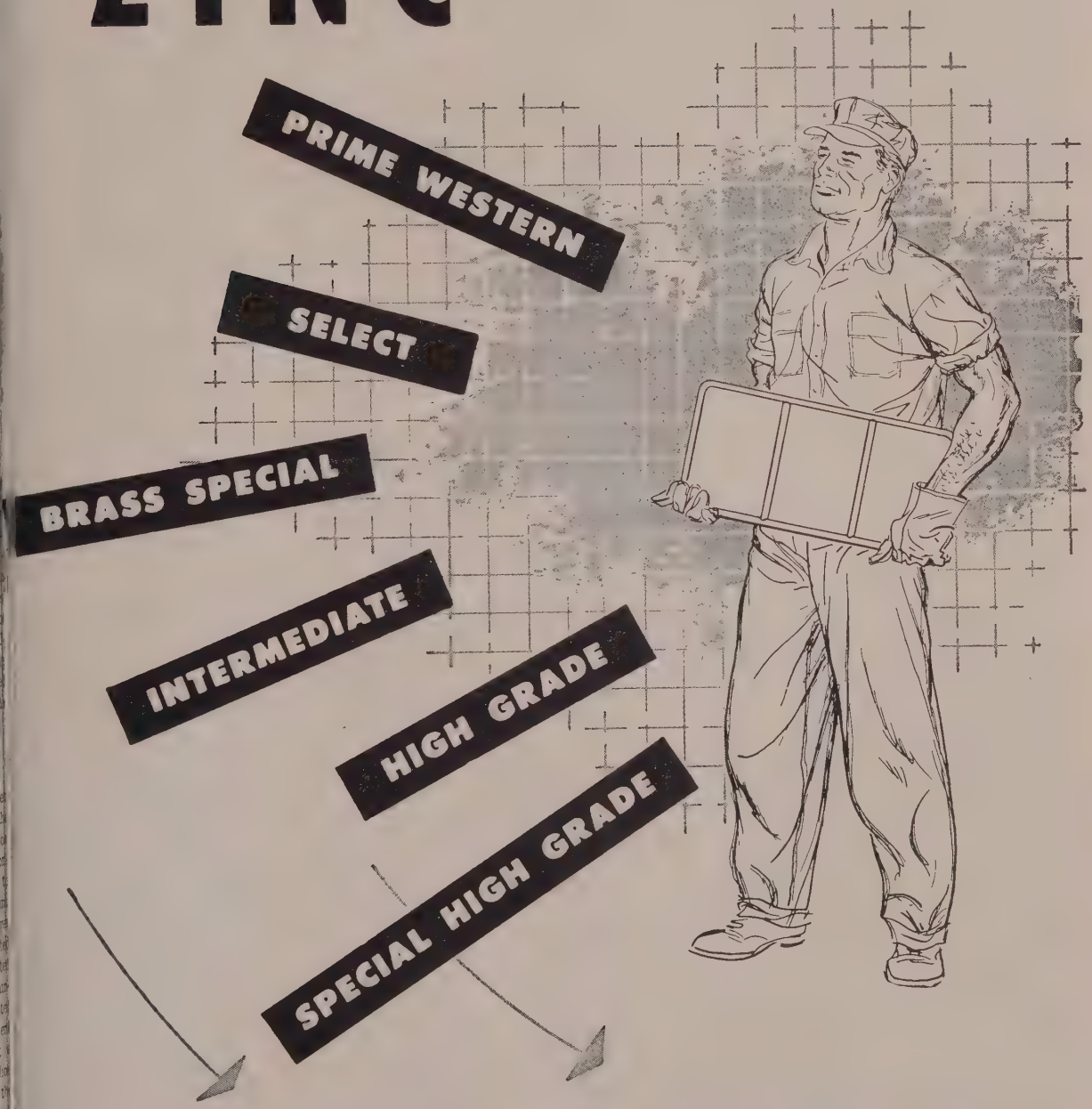
Aluminum strip featuring superior drawing characteristics is now in production at Scovill Mfg Co., Waterbury, Conn. Close control of grain size, temper, directional properties and dimensions is gained by use of bell-type nitrogen atmosphere annealing furnace. Orange peel and earring effects are minimized. The cold-rolled aluminum strip will be available in coils up to 4170 feet long.

Long-Term Contracts Justified

Aluminum Import Corp. has been granted leave to intervene in the Justice department suit against Alcoa which seeks cancellation of a contract between the two for sale by Alcoa of 600,000 tons of aluminum. Import immediately filed an answer arguing that the metal contracted to Alcoa and Kaiser was not diverted from normal requirements of nonintegrated fabricators, but represented a modification of a sales agreement with the British government at a financial sacrifice of over $10 million "that could be justified only by the long-term commitment of the producers to take metal in later years." These contracts, explains Import, will facilitate expansion of Alcan's Kitimat, B. C., smelter. Import also says that its reservation of 110,000 tons of aluminum per year over the next seven years was greater than nonintegrated fabricators had ever bought.

SLAB ZINC

every grade of ZINC
for urgent military and
civilian requirements



AMERICAN ZINC SALES COMPANY

Distributors for

AMERICAN ZINC, LEAD & SMELTING COMPANY

Columbus, O. Chicago St. Louis New York

STEEL PRICES

Mill prices as reported to STEEL, cents per pound except as otherwise noted. Changes shown in italics.
Code numbers following mill points indicate producing company; key on page 193. Key to footnotes, page 195

—SEMIFINISHED—

INGOTS, Carbon, Forging (NT)
Fontana,Calif. K1 ....$86.00
Munhall,Pa. U5 .....59.00

INGOTS, Alloy (NT)
Detroit R7 .....$63.00
Fontana,Calif. K1 .....88.00
Midland,Pa. C18 .....62.00
Munhall,Pa. U5 .....62.00

BILLETS, BLOOMS & SLABS
Carbon Rerolling (NT)
Aliquippa,Pa. J5 ....$62.50
Bessemer,Pa. U5 .....62.00
Clairton,Pa. U5 .....62.00
Ensley,Ala. T2 .....62.00
Fairfield,Ala. T2 .....62.00
Fontana,Calif. K1 ....81.00
Gary,Ind. U5 .....62.00
Johnstown,Pa. B2 .....62.00
Lackawanna,N.Y. B2 ..62.00
Munhall,Pa. U5 .....62.00
So.Chicago,Ill. U5 ....62.00
So.Duquesne,Pa. U5 ..62.00

Carbon, Forging (NT)
Aliquippa,Pa. J5 ....$75.50
Bessemer,Pa. U5 .....75.50
Buffalo R2 .....75.50
Canton,O. R2 .....75.50
Clairton,Pa. U5 .....75.50
Cleveland R2 .....75.50
Conshohocken,Pa. A3 ..82.50
Detroit R7 .....78.50
Ensley,Ala. T2 .....75.50
Fairfield,Ala. T2 .....75.50
Fontana,Calif. K1 ....94.50
Gary,Ind. U5 .....75.50
Geneva,Utah C11 ....75.50
Houston S5 .....85.50
Johnstown,Pa. B2 ....75.50
Lackawanna,N.Y. B2 ..75.50
LosAngeles B3 .....94.50
Munhall, Pa. U5 .....75.50
Seattle B3 .....94.50
So.Chicago R2,U5,W14.75.50
So.Duquesne,Pa. U5 ..75.50
So.SanFrancisco B3 ...94.50

Alloy, Forging (NT)
Bethlehem,Pa. B2 ....$82.00
Buffalo R2 .....82.00
Canton,O. R2 .....82.00
Canton,O. T7 .....84.60
Conshohocken,Pa. A3 ..89.00
Detroit R7 .....85.00
Fontana,Calif. K1 ....101.00
Gary,Ind. U5 .....82.00
Houston S5 .....92.00
Ind.Harbor,Ind. Y1 ..82.00
Johnstown,Pa. B2 ....82.00
Lackawanna,N.Y. B2 ..82.00
LosAngeles B3 .....102.00
Massillon,O. R2 .....82.00
Midland,Pa. C18 .....82.00
Munhall,Pa. U5 .....82.00
So.Chicago R2,U5,W14.82.00
So.Duquesne,Pa. U5 ...82.00
Struthers,O. Y1 .....82.00
Warren,O. C17 .....82.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 .....$92.50
Canton,O. R2 .....92.50
Cleveland R2 .....92.50
Fontana,Calif. K1 ...113.50
Gary,Ind. U5 .....92.50
Massillon,O. R2 .....92.50
So.Chicago,Ill. R2 ....92.50
So.Duquesne,Pa. U5 ..92.50

SHEET BAR (NT)
Fontana,Calif. K1 ....$93.18

SKELP
Aliquippa,Pa. J5 .....3.85
Munhall,Pa. U5 .....3.75
Warren,O. R2 .....3.75
Youngstown R2, U5 ...3.75

WIRE RODS
Aliquippa,Pa. J5 .....4.525
Alton,Ill. L1 .....4.70
AlabamaCity,Ala. R2 ..4.525
Buffalo W12 .....4.525
Cleveland A7 .....4.525
Donora,Pa. A7 .....4.525
Fairfield,Ala. T2 .....4.525
Fontana,Calif. K1 ....5.325
Johnstown,Pa. B2 .....4.525
Houston S5 .....4.925
Minnequa,Colo. C10 ..4.775
Monessen,Pa. P7 .....4.725
Joliet,Ill. A7 .....4.525
KansasCity,Mo. S5 ....4.865
LosAngeles B3 .....5.325
No.Tonawanda,N.Y.B11 4.525
Pittsburg,Calif. C11 ..5.175
Portsmouth, P12 .....4.725
Roebling,N.J. R5 ....4.625
So.Chicago,Ill. R2 ....4.525
SparrowsPoint,Md. B2 .4.625
Sterling,Ill.(1) N15 ...4.525
Struthers,O. Y1 .....4.525
Torrance,Calif. C11 ...5.325
Worcester,Mass. A7 ...4.825

—STRUCTURALS—

Carbon Steel Stand. Shapes
AlabamaCity, Ala. R2 ..4.10
Aliquippa,Pa. J5 .....4.10
Bethlehem,Pa. B2 .....4.15
Bessemer,Ala. T2 .....4.10
Clairton,Pa. U5 .....4.10
Fairfield,Ala. T2 .....4.10
Fontana,Calif. K1 ....4.75
Gary,Ind. U5 .....4.10
Geneva,Utah C11 .....4.10
Houston S5 .....4.80
Ind.Harbor,Ind I-2 ....4.10
Johnstown,Pa. B2 ....4.15
KansasCity,Mo. S5 ....4.80
Lackawanna,N.Y. B2 ..4.15
LosAngeles B3 .....4.80
Minnequa, Colo. C10 ....4.55
Munhall,Pa. U5 .....4.10
Niles,Calif.(22) P1 ....4.91
Phoenixville,Pa. P4 ....4.95
Seattle B3 .....4.85
So.Chicago,Ill. U5. W14.4.10
So.SanFrancisco B3 ...4.75
Torrance,Calif. C11 ....4.80
Weirton,W.Va. W6 ....4.35

Wide Flange
Bethlehem,Pa. B2 .....4.15
Clairton,Pa. U5 .....4.10
Fontana,Calif. K1 ....5.30
Lackawanna,N.Y. B2 ..4.15
Munhall,Pa. U5 .....4.10
So.Chicago,Ill. U5 .....4.10

Alloy Stand. Shapes
Clairton,Pa. U5 .....5.00
Fontana,Calif. K1 ....6.40
Gary,Ird. U5 .....5.00
Munhall,Pa. U5 .....5.00
So.Chicago,Ill. U5 .....5.00

H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 .....6.175
Bessemer, Ala. T2 ....6.175
Bethlehem,Pa. B2 .....6.20
Clairton,Pa. U5 .....6.175
Fairfield,Ala. T2 .....6.175
Fontana,Calif. K1 ....6.825
Gary,Ind. U5 .....6.175
Geneva,Utah C11 ....6.175
Ind Harbor,Ind. I-2 ..6.175
Ind.Harbor,Ind. Y1 ..6.675
Johnstown,Pa. B2 .....6.20
Lackawanna,N.Y. B2 ...6.20
LosAngeles B3 .....6.85
Munhall,Pa. U5 .....6.175
Seattle B3 .....6.90
So.Chicago,Ill U5, W14 6.175
So.SanFrancisco B3 ....6.80
Struthers,O. Y1 .....6.675

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 .....6.20
Lackawanna,N.Y. B2 ..6.20
Munhall,Pa. U5 .....6.125
So.Chicago,Ill. U5 .....6.125

BEARING PILES
Munhall,Pa. U5 .....4.10
So.Chicago,Ill. U5 .....4.10

—PILING—

STEEL SHEET PILING
Ind.Harbor,Ind. I-2 ...4.925
Lackawanna,N.Y. B2 ...4.925
Munhall,Pa. U5 .....4.925
So.Chicago,Ill. U5 ....4.925

—PLATES—

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..4.10
Aliquippa,Pa. J5 .....4.10
Ashland,Ky. (15) A10 ..4.10
Bessemer,Ala. T2 .....4.10
Clairton,Pa. U5 .....4.10
Claymont,Del. C22 ....4.55
Cleveland J5, R2 .....4.10
Coatesville,Pa. L7 .....4.35
Conshohocken,Pa. A3 ..4.55
Ecorse,Mich. G5 .....4.65
Fairfield,Ala. T2 .....4.10
Fontana,Calif.(30) K1 ..4.75
Gary,Ind. U5 .....4.10
GraniteCity,Ill. G4 ....4.60
Geneva,Utah C11 .....4.10
Harrisburg,Pa. C5 ....6.50
Houston S5 .....4.60
Ind.Harbor,Ind. I-2, Y1.4.10
Johnstown,Pa. B2 .....4.10
Lackawanna,N.Y. B2 ..4.10
Minnequa,Colo. C10 ....4.95
Munhall,Pa. U5 .....4.10
Pittsburgh J5 .....4.10
Riverdale, Ill. A1 .....4.10
Seattle B3 .....5.00
Sharon,Pa. S3 .....4.10
So.Chicago,Ill. U5, W14 4.10
SparrowsPoint,Md. B2 ..4.10
Steubenville,O. W10 ...4.10
Warren,O. R2 .....4.10
Weirton, W.Va. W6 ....4.40
Youngstown R2, U5, Y1.4.10

PLATES, Carbon A.R.
Fontana,Calif. K1 .....5.90
Geneva,Utah C11 .....5.25

PLATES, Wrought Iron
Economy,Pa. B14 .....9.30

PLATES,High-Strength Low-Alloy
Aliquippa,Pa. J5 .....6.25
Bessemer,Ala T2 .....6.25
Clairton,Pa. U5 .....6.25
Cleveland J5 .....6.25
Conshohocken,Pa. A3 ..6.50
Ecorse,Mich. G5 .....7.10
Fairfield,Ala. T2 .....6.25
Fontana,Calif. (30) K1 .6.95
Gary, Ind. U5 .....6.25
Geneva,Utah C11 .....6.25
Ind.Harbor,Ind. I-2 ....6.25
Ind.Harbor,Ind. Y1 ....6.75
Johnstown,Pa. B2 .....6.25
Lackawanna,N.Y. B2 ..6.25
Munhall,Pa. U5 .....6.25
Pittsburgh J5 .....6.25
Seattle B3 .....7.15
Sharon,Pa. S3 .....6.25
So. Chicago,Ill. U5, W14.6.25
SparrowsPoint,Md. B2 ..6.25
Youngstown U5 .....6.25
Youngstown Y1 .....6.75

PLATES, Alloy
Claymont,Del. C22 ....5.65
Coatesville,Pa. L7 ....5.75
Fontana,Calif. K1 ....6.60
Gary,Ind. U5 .....5.55
Johnstown,Pa. B2 .....5.55
Munhall,Pa. U5 .....5.55
Sharon,Pa. S3 .....5.70
So.Chicago,Ill. U5, W14 5.55
SparrowsPoint,Md. B2 ..5.55

FLOOR PLATES
Cleveland J5 .....5.15
Conshohocken,Pa. A3 ..5.15
Ind. Harbor,Ind. I-2 ....5.15
Munhall,Pa. U5 .....5.15
So.Chicago,Ill. U5 .....5.15

PLATES, Ingot Iron
Ashland,c.l. (15) A10 ..4.35
Ashland,l.c.l. (15) A10..4.85
Cleveland, c.l. R2 .....4.70
Warren,O. c.l. R2 ....4.70

—BARS—

BARS, Hot-Rolled Carbon
AlabamaCity, Ala. R2 ..4.15
Aliquippa,Pa. J5 .....4.15
Alton,Ill. L1 .....4.50
Atlanta,Ga. A11 .....4.40
Bessemer,Ala, T2 .....4.15
Buffalo R2 .....4.15
Clairton,Pa, U5 .....4.15
Canton,O. R2 .....4.15
Cleveland R2 .....4.15
Detroit R7 .....4.30
Ecorse,Mich. G5 .....4.50
Emeryville,Calif. J7 ....4.90
Fairfield,Ala. T2 .....4.15
Fontana,Calif. K1 .....4.85
Gary,Ind. U5 .....4.15
Houston S5 .....4.65
Ind.Harbor,Ind. I-2, Y1.4.15
Johnstown,Pa. B2 ....4.15
KansasCity,Mo. S5 ....4.85
Lackawanna,N.Y. B2 ..4.15
LosAngeles B3 .....4.85
Milton,Pa. B6 .....4.55
Minnequa,Colo. C10 ....4.60
Niles,Calif. P1 .....4.85
N.Tonawanda,N.Y.B11 ..4.15
Pittsburg,Calif. C11 ....4.85
Pittsburgh J5 .....4.15
Portland,Oreg. O4 ....4.90
Seattle B3, N14 .....4.90
So.Chicago R2, U5, W14 4.15
So.Duquesne,Pa. U5 ....4.15
So.SanFran.,Calif. B3...4.90
SterlingIll.(1) N15 ....4.15
Struthers,O. Y1 .....4.15
Torrance,Calif. C11 ....4.85
Weirton,W.Va. W6 ....4.30
Youngstown R2, U5 ....4.15

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 ....4.875
Buffalo R2 .....4.875
Canton,O. T7 .....5.02
Canton,O. R2 .....4.875
Clairton,Pa. U5 .....4.875
Detroit R7 .....5.025
Ecorse,Mich. G5 .....5.225
Fontana,Calif. K1 ....5.925
Gary,Ind. U5 .....4.875
Houston S5 .....5.375
Ind.Harbor,Ind. I-2, Y1 4.875
Johnstown,Pa. B2 ....4.875
KansasCity,Mo. S5 ....5.575
Lackawanna,N.Y. B2..4.875
LosAngeles B3 .....5.925
Massillon,O. R2 .....4.875
Midland,Pa. C18 .....4.875
So.Chicago R2, U5,W14 4.875
So.Duquesne,Pa. U5 ..4.875
Struthers,O. Y1 .....4.875
Warren,O. C17 .....4.875
Youngstown U5 .....4.875

BARS & SMALL SHAPES, H.R.
High-Strength Low-Alloy
Aliquippa,Pa. J5 ....6.225
Bessemer,Ala T2 ....6.225
Bethlehem,Pa. B2 ....6.225
Clairton,Pa. U5 .....6.225
Ecorse,Mich. G5 .....6.875
Fairfield,Ala. T2 .....6.225
Fontana,Calif. K1 ....7.475
Gary,Ind. U5 .....6.225
Ind.Harb.,Ind. Y1 ....6.725
Ind.Harb., Ind. I-2 ....6.225
Johnstown,Pa. B2 .....6.225
Lackawanna,N.Y. B2 ..6.225
LosAngeles B3 .....6.925
Pittsburgh J5 .....6.225
Seattle B3 .....6.975
So.Chicago W14 .....6.225
So.Duquesne,Pa. U5 ..6.225
So.SanFrancisco B3 ..6.975
Struthers,O. Y1 .....6.725
Youngstown U5 .....6.225

BAR SIZE ANGLES;H.R.CARBON
Bethlehem,Pa. B2 .....4.35

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 .....4.15
Atlanta A11 .....4.40
Niles,Calif. P1 .....4.85
SanFrancisco S7 .....5.10

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 .....5.00
Fontana,Calif. K1 .....6.00
Gary,Ind. U5 .....5.00
Houston S5 .....5.70
KansasCity S5 .....5.90
Youngstown U5 .....5.00

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ....5.20
BeaverFalls,Pa. M12, R2 5.20
Buffalo B5 .....5.25
Camden,N.J. P13 .....5.65
Carnegie,Pa. C12 .....5.20
Chicago W18 .....5.20
Cleveland A7, C20 .....5.20
Detroit P17, R7 .....5.35
Detroit B5 .....5.40
Donora,Pa. A7 .....5.20
Elyria,O. W8 .....5.20
FranklinPark,Ill. N5 ....5.20
Gary,Ind. R2 .....5.20
GreenBay,Wis. F7 ....5.185
Hammond,Ind. L2, M13 5.20
Hartford,Conn. R2 .....5.75
Harvey,Ill. B5 .....5.20
LosAngeles R2 .....6.65
Mansfield,Mass. B5 .....5.75
Massillon,O. R2 ,R8 ....5.20
Monaca,Pa. S17 .....5.20
Newark,N.J. W18 .....5.65
NewCastle,Pa. (17) B4..5.20
Pittsburgh J5 .....5.20
Plymouth,Mich. P5 .....5.45
Putnam,Conn. W18 ....5.75
Readville,Mass. C14 ....5.75
St.Louis,Mo. M5 .....5.50
So.Chicago,Ill. W14 ....5.20
SpringCity,Pa. K3 .....5.65
Struthers,O. Y1 .....5.20
Waukegan,Ill. A7 .....5.20
Worcester,Mass. W19 ..6.10
Youngstown F3, Y1 ....5.20

BARS, Cold-Finished Carbon
(Turned and Ground)
Cumberland,Md. (5) C19.4.45

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ....6.325
BeaverFalls,Pa. M12 ..6.325
Bethlehem,Pa. B2 .....6.325
Buffalo B5 .....6.325
Camden,N.J. P13 .....6.50
Canton,O. R2 .....6.325
Canton,O. T7 .....6.29
Carnegie,Pa. C12 .....6.00
Chicago W18 .....6.
Cleveland A7, C20 ....6.
Detroit P17, R7 .....6.
Detroit B5 .....6.
Donora,Pa. A7 .....6.
Elyria,O. W8 .....6.
Gary,Ind. R2 .....6.
Hammond,Ind. L2, M13.6.
Hartford,Conn. R2 ....6.
Harvey,Ill. B5 .....6.
Lackawanna,N.Y. B2 ..6.
Mansfield,Mass. B5 ...6.
Massillon,O. R2, R8 ..6.
Midland,Pa. C18 .....6.
Monaca,Pa. S17 .....6.
Newark,N.J. W18 .....6.
Plymouth,Mich. P5 ....6.
So.Chicago,Ill. R2, W14.6.
SpringCity,Pa. K3 .....6.
Struthers,O. Y1 .....6.
Warren,O. C17 .....6.
Waukegan,Ill. A7 .....6.
Worcester,Mass. A7 ...6.
Youngstown F3, Y1 ...6.

BARS, Reinforcing (Fabricato
AlabamaCity,Ala. R2 ..4
Atlanta A11 4
Buffalo R2 4
Cleveland R2 4
Emeryville,Calif. J7 4
Fairfield,Ala. T2 4
Fontana,Calif. K1 4
Gary,Ind. U5 4
Houston S5 4
Ind.Harbor,Ind. I-2, Y1.4
Johnstown,Pa. B2 4
KansasCity,Mo. S5 4
Lackawanna,N.Y. B2 ...4
LosAngeles B3 4
Milton,Pa. B6 4
Minnequa,Colo. C10 4
Niles,Calif. P1 4
Pittsburg,Calif. C11 4
Pittsburgh J5 4
SandSprings,Okla. S5 ..4
Seattle B3, N14 4
So.Chicago,Ill. R2 4
So.Duquesne,Pa. U5 4
So.SanFrancisco B3 4
SparrowsPoint,Md. B2 ..4
Sterling,Ill. (1) N15 ...4
Struthers,O. Y1 4
Torrance,Calif. C11 4
Youngstown R2, U5 4

BARS, Reinforcing
(Fabricated; to consumers
Johnstown, ¼-1" B2 ...4
KansasCity S5 4
LosAngeles B3 4
Marion,O. P11 4
Seattle N14 4
Seattle B3 4
So.SanFrancisco B3 4
SparrowsPt. ½-1" B2 ..4
Williamsport,Pa. S19 ...4

RAIL STEEL BARS
Avis,Pa.(4) J8 .....
ChicagoHts.(3) C2 ....
ChicagoHts.(4) C2 ....
ChicagoHts.(3.4) I-2 ...
Franklin,Pa.(3) F5 ....
Franklin,Pa.(4) F5 ....
FortWorth,Tex.(26) T4..
Marion,O.(3) P11 .....
Moline,Ill.(3) R2 .....
Tonawanda(3.4) B12 ...
Williamsport(3) S19 ...
Williamsport,Pa.(4) S19.

BARS, Wrought Iron
Economy,Pa.(S.R.) B14.1
Economy,Pa.(D.R.)B14 1
Economy(Staybolt) B14.1
McK.Rks.(Staybolt) L5.1
McK.Rks.(S.R.) L5 ...1
McK.Rks.(D.R.) L5 ...1

—SHEETS—

SHEETS, Hot-Rolled Steel
(18 gage and heavier)
AlabamaCity,Ala. R2 .3
Ashland,Ky.(8) A10 ..3
Butler,Pa. A10 3
Cleveland J5, R2 3
Conshohocken,Pa. A3 ..4
Detroit M1 .....
Ecorse,Mich. G5 4
Fairfield,Ala. T2 3
Fairless,Pa. U5 4
Fontana,Calif. K1 .....
Gary,Ind. U5 3
Geneva,Utah C11 4
GraniteCity,Ill. G4 ....
Ind.Harbor,Ind. I-2, Y1.3
Irvin,Pa. U5 3
Lackawanna,N.Y. B2..3
Munhall,Pa. U5 3

les.O. N12 .....5.425
ttsburg.Calif. C11 ..4.625
ttsburgh J5 .....3.925
verdale,Ill. A1 .....3.925
aron.Pa. S3 .....4.225
.Chicago.Ill. W14 ...3.925
arrowsPoint,Md. B2..3.925
eubenville.O. W10 ..3.925
rrance.Calif. C11 ..4.625
arren.O. R2 .....3.925
eirton.W.Va. W6 ...3.925
oungstown U5, Y1 ..3.925

HEETS, H.R. (19 gage)

labamaCity,Ala. R2 ..5.225
over.O. R1 .....5.975
ansfield.O. E6 .....5.80
lles.O. N12 .....5.20
rrance,Calif. C11 ...5.875

HEETS, H.R. (14 ga. heavier)
High-Strength Low-Alloy

leveland J5, R2 ....5.90
onshohocken.Pa. A3 ..6.15
eorse.Mich. G5 .....6.375
airfield.Ala. T2 .....5.90
ontana.Calif. K1 .....7.00
ary.Ind. U5 .....5.90
nd.Harbor,Ind. I-2 ....5.90
nd.Harbor,Ind. Y1 ....6.40
rvin.Pa. U5 .....5.90
ackawanna(35) B2 ...5.90
unhall.Pa. U5 .....5.90
ittsburgh J5 .....5.90
aron.Pa. S3 .....5.90
.Chicago.Ill. U5 ....5.90
arrowsPoint(38) B2 ..5.90
arren.O. R2 .....5.90
eirton.W.Va. W6 ....6.175
oungstown U5 .....5.90
oungstown Y1 .....6.40

HEETS, Hot-Rolled Ingot Iron
(18 Gage and Heavier)

shland.Ky.(8) A10 ..4.175
leveland R2 .....4.525
nd. Harbor,Ind. I-2 ..4.175
arren.O. R2 .....4.525

HEETS, Cold-Rolled Steel
(Commercial Quality)

utler.Pa. A10 .....4.775
leveland J5, R2 .....4.775
eorse.Mich. G5 .....4.975
airfield.Ala. T2 .....4.775
airless.Pa. U5 .....4.875
ollansbee.W.Va. F4 ..5.775
ontana.Calif. K1 ....5.875
ary.Ind. U5 .....4.775
raniteCity.Ill. G4 ....5.275
nd.Harbor,Ind. I-2,Y1 4.775
rvin.Pa. U5 .....4.775
ackawanna,N.Y. B2 ..4.775
iddletown.O. A10 ....4.775
ittsburg.Calif. C11 ..5.725
ittsburgh J5 .....4.775
parrowsPoint,Md. B2..4.775
teubenville.O. W10 ....4.775
arren.O. R2 .....4.775
eirton,W.Va. W6 ....4.775
oungstown Y1 .....4.775

HEETS, Cold-Rolled
High-Strength Low-Alloy

leveland J5, R2 .....7.225
eorse.Mich. G5 .....7.675
ontana.Calif. K1 ....5.275
ary.Ind. U5 .....7.225
ndianaHarbor,Ind. Y1 .7.725
rvin.Pa. U5 .....7.225
ackawana(37) B2 ...7.225
ittsburgh J5 .....7.225
parrowsPoint (38) B2.7.225
arren.O. R2 .....7.225
eirton,W.Va. W6 ....7.475
oungstown Y1 .....7.725

HEETS, Cold-Rolled Ingot Iron

utler.Pa. A10 .....5.275
leveland R2 .....5.375
iddletown.O. A10 ....5.275
arren.O. R2 .....5.375

HEETS, Gal'd No. 10 Steel

labamaCity.Ala. R2 ..5.275
shland.Ky. (8) A10 ..5.275
anton.O. R2 .....5.275
over.O. R1 .....5.675
airfield.Ala. T2 ....5.275†
ary.Ind. U5 .....5.275†
raniteCity.Ill. G4 ....5.475
nd.Harbor,Ind. I-2 ..5.325
rvin.Pa. U5 .....5.275†
okomo.Ind.(13) C16..5.375
arunsFerry.O. W10 ..5.275
les.O. N12 .....5.80
ittsburg.Calif. C11 ...6.025†
haron.Pa. S3 .....5.45
parrowsPoint,Md. B2 5.275
teubenville.O. W10 ..5.275
orrance.Calif. G11 ..6.275†
eirton,W.Va. W6 ....5.275

†Based on 5c zinc.

SHEETS, Galvanized No. 10
High-Strength Low-Alloy

Irvin.Pa. U5 .....7.925
SparrowsPoint(39) B2 .8.075

SHEETS, Galvanized Ingot Iron
No. 10 flat

Ashland.Ky.(8) A10 ..5.525
Canton.O. R2 .....6.025

SHEETS, Culvert	Cu Alloy	Cu Fe
Ashland,Ky. A10	6 323	...
Canton.O. R2	..6 475	6.925
Fairfield T2	....6 075	6 325
Gary,Ind. U5	..6 075	6 325
Ind.Harbor I-2	..6 075	6.325
Irvin.Pa. U5	..6 075	6.325
Kokomo,Ind C16	6.525	....
MartinsFry..O.W10	6 075	...
Pitts..Cal. C11	.6.825	....
SparrowsPt. B2	6 075	....
Torrance,Calif.C11	6.825	....

SHEETS, Culvert	Pure Iron
Ashland.Ky. A10	.....6.575
Fairfield.Ala. T2	.... 6.325
MartinsFerry.O. W10	..6.325

SHEETS, Galvannealed Steel

Canton.O. R2 .....5.825
Irvin.Pa. U5 .....5.825†
Kokomo.Ind.(13) C16 ..5.925
Niles.O. N12 .....6.35

†Based on 5c zinc

SHEETS, ZINCGRIP Steel

Butler.Pa. A10 .....5.525
Middletown.O. A10 ....5.525

SHEETS, ZINCGRIP Ingot Iron

Butler.Pa. A10 .....5.775
Middletown.O. A10 ....5.775

SHEETS, Electrogalvanized

Cleveland R2 (28) 6.125
Niles.O. R2 (28) 6.125
Weirton,W.Va. W6 ....5.975

SHEETS, ALUMINIZED

Butler.Pa. A10 .....8.625

SHEETS, Enameling Iron

Ashland.Ky.(8) A10 ...5.175
Cleveland R2 .....5.175
Gary.Ind. U5 .....5.175
GraniteCity.Ill. G4 ...5.875
Ind.Harbor.Ind. I-2 ...5.175
Irvin.Pa. U5 .....5.175
Middletown.O. A10 ....5.175
Youngstown Y1 .....5.175

BLUED STOCK, 29 ga.

Yorkville.O. W10 .....7.20
Follansbee,W.Va. F4 ....7.30
Follansbee (23) F4 ..7.175

SHEETS, Long Terne Steel
(Commercial Quality)

BeechBott'm.W.Va.W10 5.675
Gary.Ind. U5 .....5.675
Mansfield.O. E6 .....6.25
Middletown.O. A10 ....5.675
Niles.O. N12 .....6.00
Weirton,W.Va. W6 ....5.675

SHEETS, Long Terne, Ingot Iron

Middletown.O. A10 ....6.075

SHEETS, Well Casing

Fontana,Calif. K1 .....6.20

—STRIP—

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2 ..3.925
Alton,Ill. L1 .....4.20
Ashland,Ky.(8) A10 ...3.925
Atlanta A11 .....4.175
Bessemer,Ala. T2 .....3.925
Bridgeport,Con.(10)S15 4.425
Buffalo (27) R2 .....3.925
Butler,Pa. (8) A10 ...3.925
Carnegie,Pa. S18 ....4.425
Conshohocken,Pa. A3 .4.325
Detroit M1 .....4.40
Ecorse,Mich. G5 .....4.225
Fairfield,Ala. T2 .....3.925
Fontana,Calif K1 .....4.70
Gary,Ind. U5 .....3.925
Houston,Tex. S5 .....4.425
Ind.Harbor,Ind. I-2,Y1.3.925
Johnstown,Pa.(25) B2..3.925
KansasCity,Mo.(9) S5..4.625
Lackaw'na,N.Y.(32) B2.3.925
LosAngeles(25) B3 ....4.675
Milton,Pa. B6 .....4.35
Minnequa,Colo. C10 ...5.025
NewBritain(10) S15 ...4.425
N.Tonawanda,N.Y. B11.3.925
Pittsburg,Calif. C11 ...4.675
Riverdale,Ill. A1 .....3.925
SanFrancisco S7 .....5.10
Seattle(25) B3 .....4.925
Seattle N14 .....4.925
Sharon,Pa. S3 .....4.225
So.Chicago,Ill. W14 ...3.925
So.SanFrancisco(25)B3 4.675
SparrowsPoint,Md. B2.3.925
Torrance,Calif. C11 ...4.675
Warren,O. R2 .....3.925
Weirton,W.Va. W6 ....4.025
Youngstown Y1, U5 ..3.925

STRIP, Hot-Rolled Alloy

Bridgeport,Conn.(10)S15 6.45
Carnegie,Pa. S18 .....6.45
Fontana,Calif. K1 .....7.80
Gary,Ind. U5 .....6.40
Houston,Tex. S5 .....6.90
KansasCity,Mo. S5 ....7.10
LosAngeles B3 .....7.60
NewBritn.,Conn.(10)S15 6.45
Sharon,Pa. S3 .....6.45
So.Chicago W14 .....6.40
Youngstown U5 .....6.40

STRIP, Hot-Rolled
High-Strength Low-Alloy

Bessemer,Ala. T2 ....5.65
Conshohocken,Pa. A3 ..6.20
Ecorse,Mich. G5 .....6.50
Fairfield,Ala. T2 .....5.65
Fontana,Calif. K1 .....7.05
Gary,Ind. U5 .....5.95
Ind.Harbor,Ind. I-2 ....5.95
Ind.Harbor,Ind. Y1 ....6.45
Lackawanna,N.Y. B2 ..6.00
LosAngeles(25) B3 ....6.40
Seattle(25) B3 .....6.65
Sharon,Pa. S3 .....5.95
So.SanFrancisco(25)B3 .6.40
SparrowsPoint,Md. B2 .6.00
Warren,O. R2 .....5.95
Weirton,W.Va. W6 ....6.30
Youngstown Y1 .....6.45
Youngstown U5 .....5.95

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10 ...4.175
Warren,O. 4.525

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6 .....5.80
Bridgeprt.Conn.(10) S15.6.15
Butler,Pa. A10 .....5.45
Cleveland A7, J5 .....5.45
Dearborn,Mich. D3 ....6.05
Detroit D2 .....5.95
Detroit M1 .....5.45
Dover,O. G6 .....5.80
Ecorse,Mich. G5 .....5.65
Follansbee,W.Va. F4 ...5.45
Fontana,Calif. K1 .....7.35
FranklinPark,Ill.(40) T6.5.70
Ind.Harbor,Ind. I-2 ....5.70
Lackawanna,N.Y. B2 ..5.45
LosAngeles C1 .....7.50
Mattapan,Mass. T6 ....6.30
Middletown,O. A10 ....5.45
NewBritain(10) S15 ....6.15
NewCastle,Pa.(14) B4 ..5.45
NewCastle,Pa. E5 ....5.95
NewHaven,Conn. A7 ....5.95
NewHaven,Conn. D2 ....6.20
Pawtucket,R.I. R3 ....6.80
Pawtucket,R.I.(21) N8..6.65
Riverdale,Ill. (40) A1 ..5.70
Rome,N.Y.(29) R6 ....5.45
Sharon,Pa. S3 .....5.30
SparrowsPoint,Md. B2 ..5.45
Trenton,N.J. R5 .....7.00
Wallingford,Conn. W2(50) .6.40
Warren,O.(40) T5 .....5.95
Warren,O. R2 .....5.45
Weirton,W.Va. W6 ....5.45
Worcester,Mass. W19 ...7.05
Youngstown C8 .....5.95
Youngstown Y1 .....5.45

STRIP, Cold-Rolled Alloy Steel

Bridgeprt,Conn.(10)S15 12.15
Carnegie,Pa. S18 .....12.00
Cleveland A7 .....12.00
Dover,O. G6 .....12.00
Fontana,Calif. K1 ....13.65
Harrison,N.J. C18 ....12.00
NewBritn,Conn.(10)S15 12.15
Pawtucket,R.I.(11) N8.12.15
Pawtucket,R.I.(12) N8.12.45
Sharon,Pa. S3 .....12.00
Worcester,Mass. A7 ...12.30
Youngstown C8 .....12.00

STRIP, Cold-Rolled
High-Strength Low-Alloy

Cleveland J5 .....7.80
Cleveland A7 .....8.15
Dearborn,Mich. D3 ....7.90
Dover,O. G6 .....8.00
Ecorse,Mich. G5 .....8.50
Lackawanna,N.Y. B2 ..8.15
Sharon,Pa. S3 .....7.65
SparrowsPoint,Md. 8.15
Warren,O. R2 .....7.60
Weirton,W.Va. W6 ....8.30
Youngstown Y1 .....8.30

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2 .....6.05

STRIP, Electrogalvanized

Dover,O. G6 .....5.70
Warren,O. T5 .....5.70
Weirton,W.Va. W6 ....5.45
Youngstown C8 .....5.95

TIGHT COOPERAGE HOOP

Atlanta A11 .....4.65
Riverdale,Ill. A1 .....4.50
Sharon,Pa. S3 .....4.55
Youngstown U5 .....4.35

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A7 American Steel & Wire
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B6 Bolardi Steel Corp.
B8 Braeburn Alloy Steel
B11 Buffalo Bolt Co.
B12 Buffalo Steel Div. H. K. Porter Co.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept., Wickwire Spencer Steel Division
C23 Charter Wire Products
C24 G. O. Carlson Inc.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur D. Driver Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Co.

G2 Globe Iron Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M16 Md. Fine & Special Wire
M17 Metal Forming Corp.

N2 National Supply Co.
N3 National Tube Div.
N5 Nelsen Steel & Wire Co.
N6 NewEng.HighCarb.Wire
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N12 Niles Rolling Mill Div.
N14 Nrthwst.Steel Roll. Mills
N15 Northwestern S.&W.Co.
N16 New Delphos Mfg. Co.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons,John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv.,EatonMfg.
R9 Rome Mfg. Co.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp
S4 Sharon Tube Co.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S25 StainlessWeldedProducts
S26 Specialty Wire Co. Ins.

T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W.Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div.,Colo.Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
W19 Worcester Pressed Steel

Y1 Youngstown Sheet&Tube

STRIP, Cold-Finished, Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Berea,O. C7	...	8.00	8.60	10.55	12.85
Bridgeport,Conn.(10) S15	6.15	8.00	8.60	10.55	12.85
Bristol,Conn. W1	...	...	8.90	10.85	....
Carnegie,Pa. S18	...	8.00	8.60	10.55	12.85
Cleveland A7	5.45	7.65	8.60	10.55	12.85
Dearbon,Mich. D3	6.05	8.25	8.85	....	....
Detroit D2	6.45	7.85	8.45	10.55	....
Dover,O. G6	6.05	8.00	8.60	10.55	12.85
FranklinPark,Ill. T6	5.80	7.80	8.75	10.70	....
Harrison,N.J. C18	...	...	8.90	10.85	13.15
Mattapan,Mass. T6	6.30	7.95	8.90	10.85	13.15
NewBritn., Conn.(10) S15	6.15	8.00	8.60	10.55	12.85
NewCastle,Pa. B4	8.30	8.00	8.60	....	....
NewCastle,Pa. E5	5.95	8.00	8.60	10.55	12.85
NewHaven,Conn. D2	6.70	7.95	8.55	10.50	....
NewYork W3	...	8.30	8.90	10.85	13.15
Pawtucket,R.I. N8: Cleve.orPitts.Base	...	8.00	8.60	10.55	12.85
Worcester,Mass.,Base	6.65	7.95	8.90	10.85	13.15
Sharon,Pa. S3	...	8.00	8.60	10.55	12.85
Trenton,N.J. R5	...	8.30	8.90	10.85	13.15
Wallingford,Conn. W2	6.65	7.95	8.90	10.85	13.15
Warren,O. T5	6.20	8.00	8.60	10.55	12.85
Weirton,W.Va. W6	5.80	8.00	8.60	10.55	12.85
Worcester,Mass. A7	5.75	7.95	8.90	10.85	13.15
Worcester,Mass. T6	6.30	7.95	8.90	10.85	13.15
Youngstown C8	...	8.00	8.60	10.55	12.85
Spring Steel (Tempered)					
Bristol,Conn. W1	...	...	12.50	15.00	....
FranklinPark,Ill. T6	...	...	12.50	15.00	18.00
Trenton,N.J. R5	...	...	12.50	15.00	18.00
Harrison,N.J. C18	...	...	12.50	15.00	18.00
NewYork W3	...	...	12.50	15.00	18.00
Worcester,Mass. T6	...	...	12.50	15.00	18.00
Youngstown C8	...	...	12.50	15.00	18.00

SILICON STEEL

SHEETS, SILICON, H.R. or C.R.(22 Ga.) COILS (cut lengths ½c lower)	Armature Field	Armature	Electric	Motor	Dynamo
BeechBottom W10 (cut lengths)	...	...	8.35	9.60	10.40
Brackenridge,Pa. A4	...	...	8.85	10.10	10.90
GraniteCity,Ill. G4 (cut lengths)	...	...	8.55	9.80	...
IndianaHarbor,Ind. I-2	8.05	8.35	8.85	(34)	...
Mansfield,O. E6 (cut lengths)	7.55	7.85	8.35	9.60	10.40
Newport,Ky. N9 (cut lengths)	...	7.85	8.35	9.60	10.40
Niles,O. N12 (cut lengths)	7.55	7.85	8.35	...	...
Vandergrift,Pa. U5	...	8.35	8.85	10.10	10.90
Warren,O. R2	8.05	8.35	8.85	10.10	10.90
Zanesville,O. A10	...	8.35	8.85	10.10	10.90

SHEETS, SILICON (22 Ga. Base) COILS (Cut Lengths ½c lower)	Transformer Grade 72	65	58	52
BeechBottom W10 (cut lengths)	10.95	11.50	12.20	13.00
Brackenridge,Pa. A4	11.45	....	....	....
Newport,Ky. N9 (cut lengths)	10.95	....	....	....
Vandergrift,Pa. U5	11.45	12.00	12.70	13.50
Warren,O. R2	11.45	....	....	....
Zanesville,O. A10	11.45	12.00	12.70	13.50

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)	T-100	T-90	T-80	T-73
Butler,Pa. A10 (C.R.)	....	....	16.05	16.55
Vandegrift, Pa. U5	14.00	14.85	15.85	16.35

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.40	$7.65	$8.05
Fairfield,Ala. T2	7.50	7.75	8.15
Fairless,Pa. U5	7.50	7.75	8.15
Gary,Ind. U5	7.40	7.65	8.05
GraniteCity,Ill. G4	7.60	7.85	8.25
IndianaHarbor,Ind. I-2, Y1	7.40	7.65	8.05
Irvin,Pa. U5	7.40	7.65	8.05
Niles,O. R2	7.40	...	...
Pittsburg,Calif. C11	8.15	8.40	8.80
SparrowsPoint,Md. B2	7.50	7.75	8.15
Weirton,W.Va. W6	7.40	7.65	8.05
Yorkville,O. W10	7.40	7.65	8.05

TIN PLATE, American Coke (Base Box)	1.25 lb	1.50 lb
Aliquippa,Pa J5	$8.70	$8.95
Fairfield,Ala. T2	8.80	9.05
Fairless,Pa. U5	8.80	9.05
Gary,Ind. U5	8.70	8.95
Ind Har. I-2, Y1	8.70	8.95
Irvin,Pa. U5	8.70	8.95
Pitts.,Cal. C11	9.45	9.70
Sp.Pt.,Md. B2	8.80	9.05
Warren,O. R2	8.70	...
Weirton,W.Va.W6	8.70	8.95
Yorkville,O. W10	8.70	8.95

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$6.50
Fairfield,Ala. T2	6.60
Fairless,Pa. U5	6.60
Gary,Ind. U5	6.50
GraniteCity,Ill. G4	6.70
Ind.Harbor,Ind. I-2,Y1	6.50
Irvin,Pa. U5	6.50
Niles,O. R2	6.50
Pittsburg,Calif. C11	7.25
SparrowsPoint,Md. B2	6.60
Warren,O. R2	6.50
Weirton,W.Va. W6	6.50
Yorkville,O. W10	6.50

HOLLOWARE ENAMELING

Black Plate (29 gage)

Follansbee,W.Va. F4	6.10
Gary,Ind. U5	6.10
GraniteCity,Ill. G4	6.30
Ind.Harbor,Ind. Y1	6.10
Irvin,Pa. U5	6.10
Yorkville,O. W10	6.55

MANUFACTURING TERNES

(Special Coated)

Fairfield,Ala. T2	$7.85
Gary,Ind. U5	7.75
Irvin,Pa. U5	7.75
Yorkville,O. W10	7.75

MANUFACTURING TERNES, 8 lb (Commercial Quality)

Gary,Ind. U5	$9.75
Yorkville,O. W10	9.75

MANUFACTURING TERNES, LT. Coated, 6 lb

Yorkville,O. W10	$8.65

ROOFING SHORT TERNES (8 lb Coated)

Gary,Ind. U5	9.75

—WIRE—

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	5.525
Aliquippa,Pa. J5	5.525
Atlanta A11	5.775
Alton,Ill. L1	5.75
Bartonville,Ill. K4	5.625
Buffalo W12	5.525
Chicago W13	5.525
Cleveland A7, C20	5.525
Crawfordsville,Ind. M8	5.625
Donora,Pa. A7	5.525
Duluth,Minn. A7	5.525
Fairfield,Ala. T2	5.525
Fostoria,O. (24) S1	5.75
Houston S5	5.925
Johnstown,Pa. B2	5.525
Joliet,Ill. A7	5.525
KansasCity,Mo. S5	6.125
Kokomo,Ind. C16	5.625
LosAngeles B3	6.475
Minnequa,Colo. C10	5.775
Monessen,Pa. P7	5.525
No.Tonawanda B11	5.525
Palmer,Mass. W12	5.825
Pittsburg,Calif. C11	6.475
Portsmouth,O. P12	5.725
Rankin,Pa. A7	5.525
So.Chicago,Ill. R2	5.525
So.SanFrancisco C10	6.475
SparrowsPoint,Md. B2	5.625
Sterling,Ill. (1) N15	5.525
Struthers,O. Y1	5.525
Torrance,Calif. C11	6.475
Waukegan,Ill. A7	5.525
Worcester,Mass. A7	5.825

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5	6.925
Alton,Ill. L1	7.15
Bartonville,Ill. K4	7.025
Buffalo W12	6.925
Cleveland A7	6.925
Donora,Pa. A7	6.925
Duluth,Minn. A7	6.925
Fostoria,O. S1	6.925
Johnstown,Pa B2	6.925
Milbury (12) N6	8.725
Minnequa,Colo. C10	7.175
Monessen,Pa. P7	6.925
Monessen,Pa. P16	6.95
Muncie,Ind. I-7	7.125
Palmer,Mass. W12	7.225
Pittsburg,Calif. C11	7.875
Roebling,N.J. R5	7.225
Portsmouth,O. P12	6.925
So.Chicago,Ill. R2	6.925
So.SanFran. C10	7.875
SparrowsPt.,Md. B2	7.025
Struthers,O. Y1	6.925
Trenton,N.J. A7	7.225
Waukegan,Ill. A7	6.925
Worcester A7, J4	7.225
Worcester T6, W12	7.225

WIRE, Upholstery Spring

Aliquippa,Pa. J5	6.625
Alton,Ill. L1	6.85
Buffalo W12	6.625
Cleveland A7	6.625
Donora,Pa. A7	6.625
Duluth,Minn. A7	6.625
Johnstown,Pa. B2	6.625
LosAngeles B3	7.575
Minnequa,Colo. C10	6.875
Monessen,Pa. P7	6.625
Monessen,Pa. P16	6.625
NewHaven,Conn. A7	6.925
Palmer,Mass. W12	6.925
Pittsburg,Calif. C11	7.375
Portsmouth,O. P12	6.625
Roebling,N.J. R5	6.925
So. Chicago,Ill. R2	6.625
So. SanFrancisco C10	7.575
SparrowsPoint,Md. B2	6.725
Torrance,Calif. C11	7.375
Trenton,N.J. A7	6.925
Waukegan,Ill. A7	6.625
Worcester,Mass. A7	6.625

WIRE, Fine & Weaving (8"Coils)

Alton,Ill. L1	10.75
Bartonville,Ill. K4	10.65
Buffalo W12	10.55
Chicago W13	10.55
Cleveland A7	10.55
Crawf'sville,Ind. M8	10.55
Fostoria,O. S1	10.55
Johnstown,Pa. B2 (43)	8.90
Kokomo,Ind. C16	10.55
Monessen,Pa. P16	10.55
Muncie,Ind. I-7	10.75
Palmer,Mass. W12	10.85
Roebling,N.J. R5	10.85
So.SanFrancisco C10	10.90
Waukegan,Ill. A7	10.55
Worcester,Mass. A7,T6	10.85

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4	9.50
Johnstown,Pa. B2	9.50
Monessen,Pa. P16	9.50
Muncie,Ind. I-7	9.70
Roebling,N.J. R5	9.80
SparrowsPt.,Md. B2	9.60

ROPE WIRE (A)

Alton,Ill. L1	9.45
Bartonville,Ill. K4	9.35
Buffalo W12	9.35
Fostoria,O. S1	9.35
Johnstown,Pa. B2	9.35
Monessen,Pa. P7, P16	9.35
Muncie,Ind I-7	9.55
Palmer,Mass. W12	9.65
Portsmouth,O. P12	9.35
Roebling,N.J. R5	9.65
SparrowsPt. B2	9.45
Struthers,O. Y1	9.35
Worcester J4, T6	9.65

(A) Plow and Mild Plow; add 0.25c for improved plow.

WIRE, Tire Bead

Alton,Ill. L1	12.75
Bartonville,Ill. K4	12.65
Monessen,Pa. P16	12.00
Roebling,N.J. R5	12.85

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	7.45
Buffalo W12	7.45
Cleveland A7	7.45
Craf'sville,Ind. M8	7.55
Dover,O. G6	7.45
Fostoria,O. S1	7.45
Kokomo,Ind. C16	7.55
FranklinPark,Ill. T6	7.60
Massillon,O. R8	7.45
Monessen,Pa. P16	8.00
Monessen,Pa. P7	7.45
Pawtkt.R.I.(12) N8	7.75
Trenton,N.J. R5	7.75
Worcester A7, T6 W12	7.75

WIRE, Merchant Quality

(6 to 8 gage)	An'ld. Galv.
AlabamaCity R2	6.675 7.075
Aliquippa J5	6.675 7.20*
Atlanta A11	6.925 7.475
Bartonville(19)K4	6.675 7.225
Buffalo W12	6.675 7.075
Cleveland A7	6.675 ....
CrawfordsvilleM8	6.775 7.325
Donora,Pa. A7	6.675 7.075†
Duluth,Minn. A7	6.675 7.075†
Fairfield T2	6.675 7.075†
Houston,Tex. S5	7.075 7.475
JohnstownB2(48)	6.675 7.225
Joliet,Ill. A7	6.675 7.075†
KansasCity,Mo.S5	7.275 7.675
Kokomo C16	6.775 7.175
LosAngeles B3	7.625 ....
Minnequa C10	6.925 7.325**
Monessen P7(48)	6.675 7.225
Palmer W12	6.975 7.375
Pitts.Calif. C11	7.625 8.025†
Prtsmth (18)P12	6.575 ....
Rankin A7	6.675 7.075†
So Chicago R2	6.075 6.325
So.S.Frn.(48) C10	7.825 8.025**
Spar'wsPt. B2(48)	6.775 7.325
Sterl'g(1)(48)N15	6.675 7.225
Struthers,O. Y1	6.675 7.175
Worcester A7	6.975 ....

*Based on 10c zinc; †5c zinc; **Subject to zinc equalization extras.

WIRE (16 gage)	An'ld. Galv. Stone	Stone
Aliquippa J5	10.63	12.72*
Bartonville(19)K4	10.73	12.51
Cleveland A7	12.50	....
Crawfordville M8	12.50	14.35
Fostoria,O. S1	12.60	14.15
Johnstown B2	12.50	14.35
Kokomo C16	12.60	14.15
Min'qua C10	12.75	14.45**
Palmer,Mass.W12	12.50	14.05
Pitts.Calif. C11	12.85	14.40†
SparrowsPt. B2	12.60	14.45
Sterling(1) N15	10.73	12.15
Waukegan A7	12.50	14.05†
Worcester A7	12.80	....

*Based on 11c zinc; †5c zinc; **Subject to zinc equalization extras.

WIRE, Barbed	Col.
AlabamaCity,Ala. R2	153
Aliquippa J5	150*
Atlanta A11	159
Bartonville,Ill.(19) K4	156
Crawfordsville,Ind. M8	159
Donora,Pa. A7	153†
Duluth,Minn. A7	153†
Fairfield,Ala. T2	153†
Houston,Tex. S5	161
Johnstown,Pa. B2	156
Joliet,Ill. A7	153
KansasCity,Mo. S5	165
Kokomo,Ind. C16	155
Minnequa,Colo. C10	159**
Monessen,Pa. P7	157
Pittsburg,Calif. C11	173†
Rankin,Pa. A7	153†
So.Chicago,Ill. R2	153
S.SanFrancisco C10	173**
SparrowsPoint,Md. B2	158
Sterling,Ill.(1) N15	156

†Based on 5c zinc; *11c zinc; **Subject to zinc equalization extras.

WOVEN FENCE, 9-15½ Ga. Col

AlabamaCity,Ala. R2	146
Ala.City,Ala.17 ga. R2	238
Ala.City,Ala.18 ga. R2	248
Aliqp'pa,Pa.9-14½ga.J5	143*
Atlanta A11	146
Bartonville,Ill.(19) K4	142
Crawfordsville,Ind. M8	145
Donora,Pa. A7	140†
Duluth,Minn. A7	140†
Fairfield,Ala. T2	140†
Houston,Tex. S5	148
Johnstown,Pa. B2	143
Johnstown 17ga.,6" B2	238
Johnstown, 4"	238
Joliet,Ill. A7	140†
KansasCity,Mo. S5	152
Kokomo,Ind. C16	142
Minnequa,Colo. C10	148**
Monessen,Pa. 9 ga. P7	148
Pittsburg,Calif. C11	163*
Rankin,Pa. A7	140†
So.Chicago,Ill. R2	146
Sterling,Ill. (1) N15	142

†Based on 5c zinc; *11c zinc; **Subject to zinc equalization extras.

BALE TIES, Single Loop Col.

AlabamaCity,Ala. R2	149
Atlanta A11	152
Bartonville,Ill.(19) K4	149
Crawfordsville,Ind. M8	157
Donora,Pa. A7	149
Duluth,Minn. A7	149
Fairfield,Ala. T2	149
Joliet,Ill. A7	149
KansasCity,Mo. S5	161
Kokomo,Ind. C16	151
Minnequa,Colo. C10	154
Pittsburg,Calif. C11	177
So.Chicago,Ill. R2	149
So.SanFran.Calif. C10	177
SparrowsPoint,Md. B2	151
Sterling,Ill.(1) N15	149

NAILS, Stock

To dealers & mfrs. (7)	Col
AlabamaCity,Ala. R2	133
Aliquippa,Pa. J5	133
Atlanta A11	134
Bartonville,Ill. (19) K4	133
Chicago,Ill. W13	133
Cleveland A9	133
Crawfordsville,Ind. M8	133
Donora,Pa. A7	133
Duluth,Minn. A7	133
Fairfield,Ala. T2	133
Galveston,Tex. D7	133
Houston,Tex. S5	133
Johnstown,Pa. B2	133
Joliet Ill. A7	133
KansasCity,Mo. S5	143
Kokomo,Ind. C16	133
Minnequa,Colo. C10	133
Monessen,Pa. P7	133
Pittsburg,Calif. C11	156
Portsmouth,O. P12	133
Rankin,Pa. A7	133
So.Chicago,Ill. R2	133
SparrowsPt.,Md. B2	133
Sterling,Ill. (1) N15	133
Worcester,Mass. A7	133

NAILS, Cut (100 lb keg) to dealers (33)

Conshohocken,Pa. A3	$8.0
Wheeling,W.Va. W10	8.0

STAPLES, Polished, Stock

To dealers & mfrs. (7)	Co
AlaoamaCity,Ala. R2	13
Aliquippa,Pa. J5	13
Atlanta A11	13
Bartonville,Ill. (19) K4	13
Crawfordsville,Ind. M8	13
Donora,Pa. A7	13
Duluth,Minn. A7	13
Fairfield,Ala. T2	13
Johnstown,Pa. B2	13
Joliet,Ill. A7	13
Kokomo,Ind. C16	13
Minnequa,Colo. C10	13
Monessen,Pa. P7	13
Pittsburg,Calif. C11	13
Portsmouth,O. P12	13
Rankin,Pa. A7	13
So.Chicago,Ill. R2	13
SparrowsPt.,Md. B2	13
Sterling,Ill. (1) N15	13
Worcester,Mass. A7	13

—FENCE POSTS—

	Co
ChicagoHts.,Ill. C2, I-2	14
Duluth,Minn. A7 (49)	13
Franklin,Pa. F5	14
Johnstown,Pa. B2	14
Marion,O. P11	14
Minnequa,Colo. C10	13
Moline,Ill. R2	14
So.Chicago,Ill. R2	14
Tonawanda,N.Y. B12	14
Williamsport,Pa. S19	13

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	15.75	list	19.75	2.5	22 25	5	23.75	6.5	23.75	6.5	23	5.75	25.5	8.25
Ambridge, Pa. N2 (†)	15.75	...	19.75	...	22.25	...	23.75	...	23.75	...	23	...	25.5	...
Corain, O. N3 (*)	15.75	4.5	19.75	5.5	22.25	8	23.75	9.5	23.75	9.50	23	8.75	25.5	11.25
Youngstown Y1 (††)	15.75	list	19.75	2.50	22.25	5.00	23.75	6.50	23.75	6.50	23.00	5.75	25.50	8.25

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2 (**)	15.75	0.75	19.75	3	22.25	5.5	23.75	7	23.75	7	23	6.25	25.5	8.75

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼		1½	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c		27.5c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28		2.73	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv.
Aliquippa, Pa. J5 (‡)	...	...	....	...	....	....	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5
Alton, Ill. L1 (§)	...	...	....	...	....	....	23.25	7	26.25	11	28.75	14.5	31.25	15.5	31.75	16.5
Benwood, W. Va. W10(††)	25.5	+0.75	17.75	+6	10.25	+10.75	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5
Butler, Pa. F6 (†)	26.5	+2.75	19.5	+7.25	12.5	+13	....	..	....	..	....	...	....	...	....	...
Etna, Pa. N2 (†)	...	...	....	...	....	....	26.25	7	29.25	11	31.75	14.5	34.25	16.25	34.75	17.25
Fontana, Calif. (§)	...	...	....	...	....	....	13.25	+3	16.25	1	18.75	4.5	21.25	5.5	21.75	6.5
Ind. Harbor Y1 (††)	...	...	....	...	....	....	25.25	9	28.25	13	30.75	16.5	33.25	17.5	33.75	18.5
Lorain, O. N3 (*)	...	...	....	...	....	....	26.25	16	29.25	20	31.75	23.5	34.25	23	34.75	24
Sharon, Pa. S4 (†)	26.5	—0.25	19.5	+4.25	12.5	+8.5	....	..	....	..	....	...	....	...	....	...
Sharon, Pa. M6	...	...	....	...	....	....	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5
Sparrows Pt., Md. B2 (§)	24.5	+1.75	17.5	+6.25	10.5	+10.5	24.25	8	27.25	12	29.75	15.5	32 25	16.5	32 75	17.5
Youngstown R2 (**)	...	...	....	...	....	....	26.25	11	29.25	15	31.75	18.5	34.25	19.25	34.75	20.25
Youngstown Y1 (††)	...	...	....	...	....	....	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5
Wheatland, Pa. W9 (§)	24.5	+1.75	17.5	+6.25	10.5	+10.5	26.25	10	29.25	14	31.75	17.50	34.25	18.50	34.75	19.50

Size—Inches	2		2½		3		3½		4	
List Per Ft.	37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft.	3.68		5.82		7.62		9.20		10.89	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	35.25	20	36.75	20	36.75	20	....	....	....	....
Alton, Ill. L1 (§)	32.25	17	33.75	17	33.75	17	....	....	....	....
Benwood W Va. W10(††)	35 25	20	36 75	20	36.75	20	27 75	10.5	27.75	10.5
Etna, Pa. (†)	35.25	17.25	36.75	18.5	36.75	18.5	27.75	9	27.75	9
Fontana, Calif. K1 (§)	22.25	7	23.75	7	23.75	7	....	....	....	....
Ind. Harbor, Ind. Y1 (††)	34.25	19	35.75	19	35.75	19	....	....	....	....
Lorain, O. N3 (*)	35.25	24.5	36.75	23	36.75	23	....	....	....	....
Sharon, Pa. M6	35.25	20	36.75	20	36.75	20	....	....	....	....
Sparrows Pt., Md. B2 (§)	32.25	18	34.75	18	34 75	18	25 75	8.5	25.75	8.5
Youngstown R2 (**)	35.25	20.75	36.75	20.5	36.75	20.5	27.75	11	27.75	11
Youngstown Y1 (††)	35.25	20	36.75	20	36.75	20	....	....	....	....
Wheatland, Pa. W9 (‡)	35.25	20	36.75	20	36.75	20	....	....	....	....

Galvanized pipe discounts based on zinc price of: (†), 14c; (‡), 11c to under 12c; (*), 5c; (§), 11.00c; ††), 10.50c-11.50c; with discounts adjusted on price of zinc at time of shipment.

BOILER TUBES

Net base c.l prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. in.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
...	13	....	21.31	18.44
¼	13	....	25.24	18.12
½	13	23.12	27.89	20.01
¾	13	26.84	32.37	23.66
...	13	30.08	36.28	26.51
1¼	13	34.18	41.23	29.86
1¼	12	37.10	44.75	32.41
1½	12	40.51	48.86	35.70
1¾	12	43.85	52.90	38.66
...	12	45.92	55.39	41.23

RAILWAY MATERIALS

	Std. No. 1	Std. No. 2	Std. Tee Rails All No. 2	60 lb Under
RAILS				
Bessemer, Pa. U5	4.325	4.225	4.275	5.20
Ensley, Ala. T2	4.325	4.225	....	5.20
Fairfield, Ala. T2	...	...	....	5.20
Gary, Ind. U5	4.325	4.225	4.275	...
Huntington, W. Va. W7	...	...	....	5.20
Indiana Harbor, Ind. I-2	4.325	4.225	4.275	...
Johnstown, Pa. B2	....	....	...(16)	5.20
Lackawanna, N.Y. B2	4.325	4.225	....	5.20
Minnequa, Colo. C10	4.325	4.125	....	5.70
Steelton, Pa. B2	4.325	4.225	....	...
Williamsport, Pa. S19	....	....	....	5.20

AXLES

Ind. Harbor, Ind. S13 ...6.50
Johnstown, Pa. B2 .....6.50

STANDARD TRACK SPIKES

Ind. Harbor, Ind. I-2, Y1 7.05
Kansas City, Mo. S5 ....7.30
Lebanon, Pa. B2 .....7.05
Minnequa, Colo C10 ....7.05
Pittsburgh J5 .....7.05
Seattle B3 .....7.55
So. Chicago, Ill. R2 .....7.05
Struthers, O. Y1 .....7.05
Youngstown R2 .....7.05

TIE PLATES

Fairfield, Ala. T2 .....5.125
Gary, Ind. U5 .....5.125
Ind. Harbor, Ind I-2 ....5.125
Lackawanna, N.Y. B2 ..5.125
Minnequa, Colo. C10 ...5.125
Pittsburg, Calif. C11 ..5.275
Seattle B3 .....5.275
Steelton, Pa. B2 .....5.125
Torrance, Calif. C11 ....5.275

TRACK BOLTS (20) Treated

Kansas City, Mo. S5 ....11.00
Lebanon, Pa. (31) B2 ..10.75
Minnequa, Colo. C10 ...11.00
Pittsburgh O3, P14 ..11.00

JOINT BARS

Bessemer, Pa. U5 ....5.275
Fairfield, Ala. T2 .....5.275
Ind. Harbor, Ind. I-2 ..5.275
Joliet, Ill. U5 .....5.275
Lackawanna, N.Y. B2 ..5.275
Minnequa, Colo. C10 ...5.275
Steelton, Pa. B2 .....5.275

RIVETS

F.o.b. Cleveland, and/or freight equalized with Pittsburgh; f.o.b. Chicago, and/or freight equalized with Birmingham except where equalization is too great.

Structural ½-in., larger 8.90c
⅞-in. under .....26.5 off

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants, per cent off list for less than case lots to consumers)

6 in. and shorter:
½-in & smaller diam. 4
⅝-in. & ⅝-in. 5
¾-in. and larger .. 3
Longer than 6 in.:
All diams. ..... +4
Lag bolts, all diams.:
6 in. and shorter.... 12
over 6 in. long 8
Ribbed Necked Carriage 5
Blank 25
Plow 25
Step, Elevator, Tap and Sleigh Shoe 12
Tire Bolts ..... List
Boiler & Fitting-Up Bolts 23

NUTS

H.P. & C.P., regular & heavy:
Square, all sizes 58
H.P., Hex, regular & heavy:
¾" and smaller 58
⅞" to 1⅛", inclusive 60
1¼" to 1½", inclusive 62
1⅝" and larger 58
C.P. Hex, regular heavy:
All sizes 58
Hot Galv. Nuts (all types):
¾" and smaller 40
⅞" to 1½", inclusive 43
Finished Hex Nuts:
New standard, all sizes 58
Semifinished & Slotted Hex:
Regular and heavy, all sizes 58

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)
1 in. diam x 6 in. and shorter 34
1 in. and smalled diam. x over 6 in. 20

HEADLESS SET SCREWS

(Packaged; per cent off list)
No. 10 and smaller ... 34
¼-in. diam & larger .. 14
N.F. thread, all diams.. 8

STEEL STOVE BOLTS

(F.o.b. plant, per cent off list in packages)
Plain finish .....47.5 & 10
Plated finishes .....30 & 10

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)
6 in. or shorter:
⅝-in. & smaller .. 38
¾-in. through 1 in. .. 22
Longer than 6 in.:
⅝-in. and smaller .. 20
¾-in. through 1 in.. 7

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1⅛" to 1 7/16"; 1 7/16" to 1 15/16" 4.55c; 1 15/16" to 7 5/16" 4.95c.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ½" and thinner.
(16) 40 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25c off for untreated.
(21) New Haven, Conn., base.
(22) Del. San Francisco Bay area.
(23) 20 Ga. 36" wide.
(24) Deduct 0.10c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing mill lengths, to fabricators; to consumers, 5.40c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; add 0.35c for universal mill.
(31) Not annealed.
(32) Rd. or square edge.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 15 gage & lighter: 60" & narrower.
(38) 14 gage & lighter: 48" and narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Plus 0.375c per 100 lb.
(43) Plus 4.7% on base and extras.
(48) 6-7 gage.
(49) U-post; add 2 cols. for T-post.
(50) 0.025 gage; 6.55c for 0.026 to 0.068 gage; 6.65c for 0.069 gage and over.

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

	Cents
Sponge iron:	
98+ % Fe, annealed	18.00
Unannealed	14.50
Swedish, c.i.f. N.Y., c.l., in bags	11.25
Electrolytic iron:	
Annealed, 99.5% Fe.	42.50
Unannealed (99+ % Fe)	36.50
Unannealed (99+ % Fe) (minus 325 mesh)	53.50
Powder Flakes	48.50
Carbonyl Iron:	
97.9-99.8% size 5 to 10 microns..83.00-148.00	
Aluminum:	
Carlots, freight allowed	31.00
Atomized, 500 lb drums, freight allowed	34.00
Antimony, 500 lb lots.	78.00
Brass, 20-ton lots	29.50-36.50
Bronze, 10-ton lots 51.00-60.00	
Copper:	
Electrolytic	43.25
Reduced	43.25
Lead	21.75
Magnesium 75.00-85.00	
Manganese:	
Minus 100 mesh	57.00
Minus 35 mesh	52.00
Minus 200 mesh	62.00
Nickel unannealed	89.50
Nickel-Silver 5-ton lots	47.00
Silicon	38.50
Solder	8.50*
Stainless Steel, 302 ...	91.00
Tin 14.00*	
Zinc, 10-ton lots..17.50-25.00	
Tungsten	Dollars
Melting grade, 99% 60 to 200 mesh:	
1000 lb and over ...	5.35
Less than 1000 lb ..	5.50
Chromium, electrolytic 99.9% Cr min.	3.50

* Plus cost of metal.

STAINLESS STEEL MILL PRICES

(Representative prices, cents per pound; subject to current lists of extras)

AISI Type	Rerolling Ingots	Rerolling Slabs, Billets	Forging Billets	Seamless Tube Billets	H.R. Strip	Shapes; H.R. & C.F. Bars; Wire	Plates	Sheets	C.R. Strip; Flat Wire
301	16.25	20.50	29.50	34.25	29.75	35.25	37.25	46.25	38.25
302	17.25	22.75	29.75	34.50	32.00	35.50	37.50	46.50	41.50
302B ...	18.50	24.50	30.50	34.50	35.00	35.50	37.50	48.75	44.75
303	18.75	24.75	32.25	37.25	36.75	38.25	39.75	48.75	45.50
304	18.25	23.75	31.00	36.00	34.25	37.25	39.75	48.75	43.75
304L ...	....	....	36.75	....	....	42.75	45.25	54.25	49.00
306	19.50	25.50	....	36.25	37.00	37.50	42.00	51.75	46.75
308	19.75	26.25	35.25	40.75	38.00	42.00	46.00	55.25	48.00
309	26.50	34.75	43.25	49.25	49.25	50.50	53.75	63.50	62.00
309S ...	28.50	37.50	47.50	54.50	54.00	55.50	59.00	68.50	68.50
310	33.00	43.25	56.75	66.25	67.50	67.50	69.00	72.25	78.75
314	....	....	....	....	....	....	69.00	74.50	....
316	28.00	36.25	46.75	54.50	55.00	55.50	59.00	64.50	66.50
316L ...	....	....	52.50	....	....	61.00	64.25	70.00	72.00
317	33.00	43.50	58.25	66.75	67.50	68.25	70.75	77.00	79.25
318	33.50	44.00	55.25	64.50	66.25	65.50	68.75	78.00	80.25
321	22.75	29.50	35.25	40.75	42.00	42.00	46.00	55.50	54.50
330	....	....	58.00	....	....	68.50	70.00	73.75	77.75
347	24.50	32.25	39.50	45.75	46.50	46.75	51.25	60.75	59.25
403	....	....	27.00	30.75	....	32.00	34.25	44.00	41.25
405	16.50	21.75	25.25	29.25	30.50	30.25	31.75	42.50	39.75
410	14.00	18.25	24.00	27.75	26.25	28.75	30.00	40.75	34.25
416	....	....	24.50	28.25	....	29.25	30.50	41.25	41.25
420	22.00	28.50	29.25	34.00	35.50	35.00	38.50	49.25	52.75
430	14.25	18.50	24.50	28.25	27.00	29.25	30.50	43.50	34.75
430F ...	....	18.75	25.00	28.75	....	29.75	31.00	44.00	44.00
431	14.50	28.50	25.00	28.25	27.50	29.25	30.50	44.00	35.25
440A,B,C	....	28.50	29.25	34.00	....	35.00	38.50	49.25	52.75
442	....	....	28.00	....	....	30.50	35.25	48.25	47.75
446	....	....	33.75	38.25	53.00	39.50	40.75	59.75	71.00
501	....	....	14.00	14.50	21.25	16.00	18.25	30.50	29.00
502	....	....	15.25	16.00	22.25	17.00	20.00	31.75	30.00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; American Steel & Wire Division, U. S. Steel Corp.; Armco Steel Corp.; J. Bishop & Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur D. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Co.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Division, Borg Warner Corp.; Jessop Steel Co.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McLouth Steel Corp.; Metal Forming Corp; Page Steel & Wire Division, American Chain & Cable Co. Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Stainless Welded Products Inc.; Superior Steel Corp.; Timken Roller Bearing Co.; Tube Methods Inc.; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

CLAD STEEL

Cladding Stainless	Plates, Carbon Base 10%	Plates, Carbon Base 20%	Sheets, Carbon Base 20%	Sheets, Copper Base Both Sid
302	....	31.00	31.00	77.00
304	27.60	32.50-32.70	32.50	77.00
310	36.50	41.00	.....	144.00
316	32.60	37.70-42.75	42.75	....
318	37.00	42.20	.....	....
321	29.30	34.40-37.00	37.00	111.00
347	30.40	35.50-40.50	40.50	130.00
405	23.40	30.60	.....	....
410	22.90	30.10	.....	....
430	22.90	30.10	.....	....
Inconel ..	41.23	54.18	.....	165.00
Nickel ..	37.50	50.90	.....	....
Monel ...	38.90	51.80	.....	....
Copper* .	....	.....	46.00	....

	Strip, Carbon Base, Cold-Rolled 10%	Cold-Rolled Both Sides	Hot-Rolled 10%	Hot-Rolled Both Sid
Copper*	27.85	35.85	24.00	32.25

* Deoxidized. Production points: Stainless sheets, Ne Castle, Ind. I-4; stainless-clad plates, Claymont Del. C Coatesville, Pa. L7, New Castle, Ind. I-4 and Washingto Pa. J3; nickel, inconel, monel-clad plates Coatesville L copper-clad strip, Carnegie, Pa. S18. Production point f copper-base sheets is Carnegie, Pa. A12.

TOOL STEEL

Grade	$ per lb	Grade	$ per
Regular Carbon .	0.25-.285	5% Cr Hot Work....	0.
Extra Carbon ..	0.33-.340	W-Cr Hot Work	0.
Special Carbon ..	0.35-.360	V-Cr Hot Work	0.
Oil Hardening ...	0.370-.39	Hi-Carbon-Cr. ..	0.665-.

Grade by Analysis (%)

W	Cr	V	Co	Mo	$ per
20.25	4.25	1.6	12.25	...	4.0
18.25	4.25	1	4.75	...	2.3
18	4	2	9	...	2.565-2.6
18	4	2	...	...	1.8
18	4	1	...	...	1.580-1.6
13.5	4	3	...	...	1.8
6.4	4.5	1.9	...	5	1.0
6	4	3	...	6	1.3
2	1.4	1.2	...	...	0.4
1.5	4	1	...	8.5	0.8

Tool steel producers include: A4, A8, B2, B8, C4, C C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

PIG IRON, Gross Ton

F.o.b. furnace prices as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem,Pa. B2	$58.00	$58.50	$59.00	$59.50
New York, del.	....	62.28	62.78	....
Newark, del.	61.02	61.52	62.02	62.52
Philadelphia, del.	60.75	61.25	61.75	62.25
Birmingham District				
AlabamaCity,Ala. R2	52.38	52.88	....	....
Birmingham R2	52.38	52.88	....	....
Birmingham U6	....	52.88	....	....
Woodward,Ala. W15	52.38	52.88	....	....
Cincinnati, del.	....	60.43	....	....
Buffalo District				
Buffalo R2, H1	56.00	56.50	57.00	....
Tonawanda,N.Y. W12	56.00	56.50	57.00	....
No. Tonawanda,N.Y. T9	....	56.50	57.00	....
Boston, del.	66.65	67.15	67.65	....
Rochester,N.Y., del.	59.02	59.52	60.02	....
Syracuse,N.Y., del.	60.12	60.62	61.12	....
Chicago District				
Chicago I-3	56.00	56.50	56.50	57.00
Gary,Ind U5	56.00	....	56.50	....
IndianaHarbor,Ind. I-2	56.00	....	56.50	....
So.Chicago,Ill. W14, Y1	56.00	56.50	56.50	....
So.Chicago,Ill. U5	56.00	....	56.50	57.00
Milwaukee, del.	58.17	58.67	58.67	59.17
Muskegon,Mich., del.	....	62.80	62.80	....
Cleveland District				
Cleveland A7	56.00	56.50	56.50	57.00
Cleveland R2	56.00	56.50	56.50	....
Akron,O., del. from Cleve.	58.75	59.25	59.25	59.75
Lorain,O. N3	56.00	....	....	57.00
Pittsburgh District				
NevilleIsland,Pa. P6	56.00	56.50	56.50	....
Pitts.,N.&S. sides, Ambridge, Aliquippa, del.	57.37	57.87	57.87	....
McKeesRocks, del.	57.04	57.54	57.54	....
Lawrenceville, Homestead, Wilmerding, Monaca, del.	57.66	58.16	58.16	....
Verona, Trafford, del.	58.19	58.69	58.69	....
Brackenridge, del.	58.45	58.95	58.95	....
Bessemer,Pa. U5	56.00	....	56.50	57.00
Clairton,Rankin,So.Duquesne,Pa. U5	56.00	....	....	....
McKeesport,Pa. N3	56.00	....	....	57.00
Midland,Pa. C18	56.00	....	....	....
Monessen,Pa. P7	56.00	....	....	....
Youngstown District				
Hubbard,O. Y1	....	....	56.50	....
Youngstown Y1	....	....	56.50	57.00
Youngstown U5	56.00	....	....	57.00
Mansfield,O., del.	60.90	....	61.40	61.90
Duluth I-3	56.00	56.50	56.50	57.00
Erie,Pa. I-3	56.00	56.50	56.50	57.00
Everett,Mass. E1	....	63.25	63.75	....
Fontana,Calif. K1	62.00	62.50	....	....
Geneva,Utah C11	57.50	58.00	....	....
GraniteCity,Ill. G4	57.90	58.40	58.90	....
Ironton,Utah C11	56.00	56.50	....	....
LoneStar,Texas L6	52.00	52.50*	52.50	....
Minnequa,Colo. C10	58.00	59.00	59.00	....
Rockwood,Tenn. T3	....	....	58.50	....
Sharpsville,Pa. S6	56.00	56.50	56.50	57.00
Steelton,Pa. B2	58.00	58.50	59.00	59.50
Swedeland,Pa. A3	60.00	60.50	61.00	61.50
Toledo,O. I-3	56.00	56.50	56.50	57.00
Cincinnati, del.	61.76	62.26	....	....
Troy,N.Y. R2	58.00	58.50	59.00	...

*Low phos. southern grade.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage ther over base grade, 1.75-2.25%, except on low phos iron on which b is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and ov

Manganese: Add 50 cents per ton for each 0.50% manganese over or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.0-6.50% silicon; add $1.50 for each 0.5% Si; 75 cents for each 0.5% Mn over 1%)

Jackson,O. G2, J1	$67
Buffalo H1	68

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.45 each 0.5% Mn over 1%; $2 per gross ton premium for 0.045% max

NiagaraFalls,N.Y. P15	$9
Keokuk,Iowa, Openhearth & Fdry, freight allowed K2	9
Keokuk, OH & Fdry, 12½ lb piglets, 16% Si, frt. allowed K2	9
Wenatchee,Wash., OH & Fdry, freight allowed K2	9

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$6
Rockwood,Tenn. T3	6
Steelton,Pa. B2	6
Philadelphia, delivered	6
Troy,N.Y. R2	6

There's a BROWNING CRANE Designed for Your job!

BROWNINGS are Star Performers on these jobs

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MAINTENANCE-OF-WAY WORK

With bucket, hook-block or magnet, this versatile Browning 30-Ton Diesel TorQflo Locomotive Crane moves from job to job at an eastern steel plant, loads and switches cars, handles any heavy crane work on production or maintenance.

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TEN basic models for heavy-materials handling with almost unlimited combinations of capacities, booms and equipment enable Browning to deliver a crane exactly suited to your needs. This wide selection assures you the right type of crane with ample power and capacity for your job. It also eliminates the necessity of over-investment in a crane larger than you need.

Brownings are the star performers of the power-crane industry . . . that's why crane men everywhere will tell you *"You can't go wrong with a Browning on the job."*

Write for complete specifications on the Browning model designed for your job.

WAGON CRANES
2 Models
17½ to 25 Tons
25 to 100 Ft. Booms

TRUCK CRANES
5 Models
8 to 30 Tons
25 to 120 Ft. Booms

LOCOMOTIVE CRANES
3 Models
25 to 50 Tons
50 to 135 Ft. Booms

THE BROWNING CRANE & SHOVEL CO.
Dept. J • 16226 Waterloo Road • Cleveland 10, Ohio

BROWNING
LOCOMOTIVE, WAGON TRUCK AND CRAWLER *Cranes*

WAREHOUSE STEEL PRODUCTS

(Representative prices, cents per pound, subject to extras, f.o.b. warehouse. City delivery charges are 20 cents per 100 lb except: New York, 3 cents; Philadelphia, 25 cents; Birmingham, Cincinnati, St. Paul, 15 cents.)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	Hot Rolled	Cold Rolled	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.‡	H.R. Alloy 4140††[6]		Carbon	Floor
Baltimore	6.20	7.64	7.81	7.00	...	6.86	8.17[6]	12.04	6.98	6.85	7.98
Birmingham	6.10	7.00	8.00[2]	6.30	...	6.15	8.90	....	6.35	6.35	8.65
Boston	6.89	7.83	9.23	7.13	...	6.87	8.35	12.28	7.06	7.13	8.26
Buffalo	6.18	7.15	9.01	6.79	...	6.35	7.70	12.17	6.59	6.68	7.88
Charlotte, N. C.	6.95	7.80	8.69	6.90	...	7.10	8.37	....	7.10	7.10	8.37
Chicago	6.18	7.12	8.05	6.42	...	6.28	7.30	11.75	6.46	6.33	7.46
Cincinnati	6.51	7.19	8.47	6.72	...	6.58	7.66	12.17	6.93	6.85	7.88
Cleveland	6.18	7.12	8.30	6.58	...	6.34	7.65	11.89	6.79	6.50	7.79
Detroit	6.38	7.31	8.34	6.71	7.36	6.56	7.60	11.92	6.93	6.85	7.80
Houston	7.15	7.85	9.32	7.45	...	7.45	...	....	7.35	7.20	8.55
JerseyCity,N.J.	6.54	7.45	8.72	6.82	...	6.75	8.43[6]	11.84	6.50	6.67	8.01
Los Angeles	7.25	9.00	9.35	7.55	11.20	7.15	9.10	13.05	7.35	7.20	9.25
Milwaukee	6.35	7.29	8.22	6.59	...	6.45	7.57	11.92	6.63	6.50	7.63
Moline, Ill.	6.53	7.47	8.40	6.77	...	6.63	7.65	....	6.81	6.68	...
New York	6.54	7.45	8.72	6.82	...	6.75	8.43[6]	11.84	6.50	6.67	8.01
Newark, N. J.	6.78	7.75	9.02	7.16	...	7.06	8.43[6]	....	6.90	6.99	8.30
Norfolk, Va.	6.90	...	...	7.20	...	7.20	8.50	....	7.20	7.15	7.85
Philadelphia	6.53	7.55	8.35	7.02	8.80	6.87	8.19[6]	11.89	6.67	6.63	7.65
Pittsburgh	6.18	7.12	8.30	6.55	...	6.28	7.65	11.89	6.46	6.33	7.46
Portland, Oreg.	7.90	9.30	10.00	7.90	...	7.60	10.90	....	7.50	7.55	9.40
Richmond, Va.	6.50	7.45	8.00	7.10	...	7.05	7.95	....	7.10	6.85	8.10
St. Louis	6.48	7.42	8.35	6.72	...	6.58	7.70	12.05	6.86	6.73	7.86
St. Paul	6.84	7.78	8.71	7.08	...	6.94	8.06	....	7.12	6.99	8.12
San Francisco	7.35	8.70	10.15	7.60	...	7.15	9.75	13.05	7.25	7.20	9.25
Seattle	8.15	8.70	10.10	8.02	...	7.58	10.13	13.50	7.50	7.59	9.40
Spokane	8.15	9.25[7]	10.10	8.50	...	7.60	11.00[8]	14.15	7.25	7.35	9.30
Washington	6.71	8.15	8.35	7.51	...	7.37	8.43	....	7.49	7.36	8.49

*Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); ‡ includes 35-cent special bar quality extra; § as rolled; †† as annealed; ** ⅛" and heavier, 8.09c for No. 12 and lighter. Base quantities, 2000 to 9999 lb except as noted. Cold-rolled strip, 2000 lb and over; Cold-finished bars, 2000 lb and over; [2]—500 to 9999 lb; [5]—1000 to 1999 lb; [6]—1000 lb and over; [7]—1500 lb to 3499; [8]—under ½ in.

Distributors Look for Buying Pickup

Demand is expected to show renewed vigor soon and to maintain satisfactory volume over balance of year. Buyers are fussier about specifications. A few items remain scarce

Chicago—Warehouses are finding that the recent upward surge in business didn't hold. Explanation isn't clear except that it may have been just a flurry following reopening of manufacturing plants after vacation shutdowns.

Inventory building in tight products like sheets, large bars, structurals and plates, still is not possible but fourth quarter holds some prospects for this. Easy products are undergoing stock increase but up to now distrubutors are not limiting what the mills can ship.

Philadelphia — Warehouse customers are getting fussier about specifications and their attitude is working back to the mill level. Though extra tonnage is being offered distributors they are only interested in popular items to get their stocks in order. Better mill deliveries of structurals and plates—top demand items now—are hoped for.

Everyone is working down his stocks of straight chromium stainless so he won't be holding the bag when nickel decontrol comes.

September buying is expected to show renewed vigor and warehouses are optimistic about the balance of the year. Established distributors find their dollar volume is better than normal but tonnage about the same. Some warehouses are beginning to worry about large customers switching back to mill ordering.

Cleveland — While the warehouses are in better position to handle orders than was the case earlier this year they are still plagued with unbalanced inventories and supplies of such items as hot-rolled sheets, wide flanged beams and heavy bars and plates still fall short of requirements despite improved receipts from the mills.

Customers are ordering more carefully and consequently warehouse salesmen have to press a little harder to get an order than formerly. Distributors are anticipating a pickup in order volume with the vacation season over and think business will hold on a relatively high plane until well toward the close of fourth quarter at which time they expect some slackening as consumers hold down inventory for tax purposes.

Boston—With distributors' inventories substantially improved procurement policies are changing accordingly. On most products only orders to specification are placed and forward buying is reduced.

Relatively few distributors are now pressing for delivery. October schedules are filled for most products, but beyond, warehouses are less worried over supply.

Mill quotas are becoming meaningless on more steel products and with few exceptions it is a matter of what is wanted rather than what can you get.

Los Angeles—Warehouse sales are spotty. Steel is getting easier to obtain from mills. Consequently more former mill buyers who turned to warehouses for stop-gap supplies are now leaving distributors' lists. Some distributors say sales are sustained by several large accounts.

Seattle—Following Labor Day warehouses expect improved business. Construction remains active and many small shops have reopened after vacations so the over-all situation is promising for active fall turnover.

Tin Plate . . .

Tin Plate Prices, Page 194

Pittsburgh—U. S. Steel Corp. and its general operating divisions, Columbia-Geneva Steel Division and Tennessee Coal & Iron Division, on Sept. 8 announced mill price bases for electrolytic and hot dipped tin plate, black plate and terne plate will be unchanged for the next pricing period. This announcement covers prices from Oct. 1 through Mar. 31, 1954.

Pressure for Sheets Less Frantic

Strong demand continues but mills note disposition on part of buyers to exercise restraint in ordering. Full fourth quarter order books seen but selling is stepped up

Sheet and Strip Prices, Page 192 & 193

Boston—Not until November will non-restricted nickel-bearing stainless flat-rolled orders be shipped in volume to meet all requirements. Higher nickel alloy melts will be processed before that month, but most producers have limited supplies of the metal.

This is likely to retard the transition period from straight chromium grades to 18-8 and other high nickel alloys. Many users and warehouses have worked down chromium stainless stocks and may go short on both the 300 and 400 series before the gap is filled.

Hot and cold-rolled carbon sheet shipments will be heavy this month and next, going far toward balancing supply in those items. More competitive selling looms for November-December.

New York — Unfilled demand for cold-rolled sheets will still be found in fourth quarter. Hot-rolled sheet and strip users will have little worry about supplies though. Order cancellations on small items here and there and requests for delayed delivery are noticeable but of no sizable proportions. Explanations most often advanced are that a company's inventories are catching up or a labor tie-up is cutting into production.

Makers of high-saturation appliances (refrigerators, stoves, washing machines, etc.) have slowed operations and radio-television producers have grown more cautious.

Philadelphia—Fourth quarter sheet business promises to be strong here but mills expect to be current by yearend. Some sellers report bookings into December on hot-rolled sheets, and expect to have a month's carryover into the fourth quarter on some types of cold-rolled sheets.

Sheet metal stampers' business is spotty at present. Automotive or farm equipment slowdowns are said to be responsible for 90 per cent of the cutbacks and cancellations.

Stocks of stainless in the 400 series in consumers' hands are dwindling.

Pittsburgh—Competition is growing among sheet producers as a buyers' market moves nearer. No difficulty is anticipated in filling fourth quarter order books, but stepped-up selling is the order of the day. Small and scattered order cancellations are reported. Cold-rolled sheet demand remains strong and steady.

Cleveland—Business is not coming to sheetmakers at quite the frantic rate of some time back but they anticipate no difficulty in filling fourth quarter order books. While some cancellations have been received, for the most part these are being taken up by other customers still in need of tonnage.

Generally, lessened demand pressure is attributed to a more conservative attitude on the part of buyers rather than actual slackening in consumption.

St. Louis—Sheet demand continues strong, although not as pressing as 90 days ago. Fourth quarter has been allocated and probably 85 per cent of orders are in. Outside inquiries are still good.

This district, like others, is awaiting the supply-demand turninng point, and there are some expectations the GM hydromatic plant fire will provide it. Mills here feel that cutoff only mildly and indirectly. No fourth quarter production curtailment is anticipated.

Granite City Steel, after a 30-day shutdown of finished steel output, started operation Sept. 3 of its new four-stand cold finishing mill, installation of which completed a two-year expansion program.

Chicago—Cancellations and setbacks in deliveries of sheets, while sizable insofar as autobuilders are concerned, still are less than had been anticipated by mills in this district.

Many customers still seek to obtain more than their quotas and there are additional orders that could be booked. The motor car builders are insisting on receiving their full November and December specifications and want to know if steel is not to be forthcoming.

Tubular Goods . . .

Tubular Goods Prices, Page 195

Youngstown—Despite reports of declining steel business local district mills report orders coming in continued good volume and company executives see no forthcoming drop in operations soon.

Part of the explanation is found in the fact that a large share of Youngstown production is steel pipe of which there is still a shortage. Big pipe makers here are Youngstown Sheet & Tube Co. and Republic Steel Corp. There has been some decline in the manufacture of small diameter galvanized pipe, the type used for home plumbing, since the freeze on copper was lifted. This probably reflects increased use of copper pipe and tubing.

Philadelphia — District consumers

Rolling Scaffold Gathers Efficiency Marks

A portable rolling scaffold, consisting essentially of a plank with some rollers on the bottom, is making roof work easier and safer at National Supply Co.'s plant at Torrance, Calif. It is shown above being used by Eldridge Purdy in putting studs on roof purlins preparatory to new roof installation. Martin Kvilvang, an employee of the company for more than ten years, designed the scaffold

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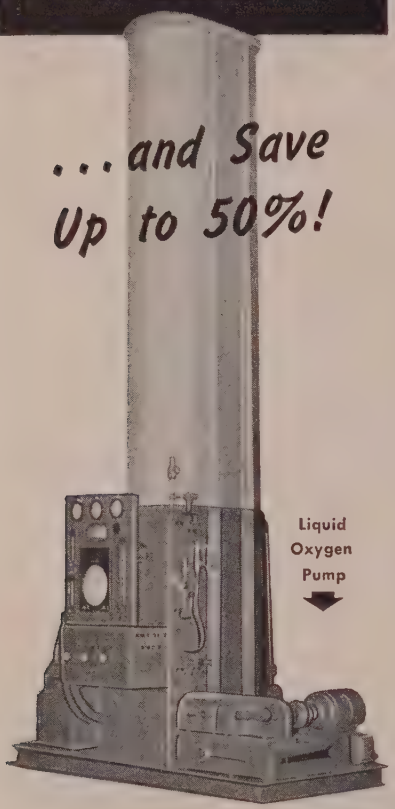

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of buttweld pipe find the market quite loose. Lapweld is relatively more scarce but can be procured without much trouble. Seamless tubing, however, will show a fair-sized carryover in fourth quarter. Main line pipe, sizes from 22 to 34-inch, is not too strong, but line pipe for smaller branches, 14 to 16-inch diameters, is active.

Pittsburgh — Demand is generally easing throughout the tubular goods market. Seamless producers, most of whom have fairly complete order books for fourth quarter, report incoming orders are lower in volume than earlier this summer. Automotive ordering is at a slightly lower level.

Semifinished Steel . . .

Semifinished Prices, Page 192

Buffalo—The district steel rate dropped 75 points to 31.5 per cent of capacity and blast furnace operations plunged 44 points to 52 per cent as Bethlehem's Lackawanna plant dropped 31 open hearths and 7 blast furnaces from the active list as result of a strike which originated in the coke oven department.

Steel Bars . . .

Bar Prices, Page 192

Chicago—Larger sizes of bars, cold-finished as well as hot-rolled, don't seem likely to move into a buyers' market for a while yet. Small diameters are in that category now and undoubtedly will remain there.

Automotive cancellations and delivery setbacks haven't been as large as expected here and production schedules for fourth quarter are being pegged at substantial levels.

New York—Small rounds are plentiful here, with October delivery possible. Bar size angles and shapes are easier to find too. Large bars continue in short supply and promise to remain so through the fourth quarter for most suppliers. Shell orders take a lot of the hot-top steel for large bars and military needs will largely determine the market status of this product.

Warehouses are turning down delivery of backed-up orders for some sizes.

Boston—Cancellations are opening up space for hot-rolled carbon bars in fourth quarter. Schedules filled for that period earlier are showing cracks. Volume with cold-rolled converters is off and they are operating closer to lead-time on hot-rolled, ordering for stock mostly rather than against orders.

Some producers have eliminated quotas on cold-finished carbon bars, 3-inch and under. Openings for Oc-

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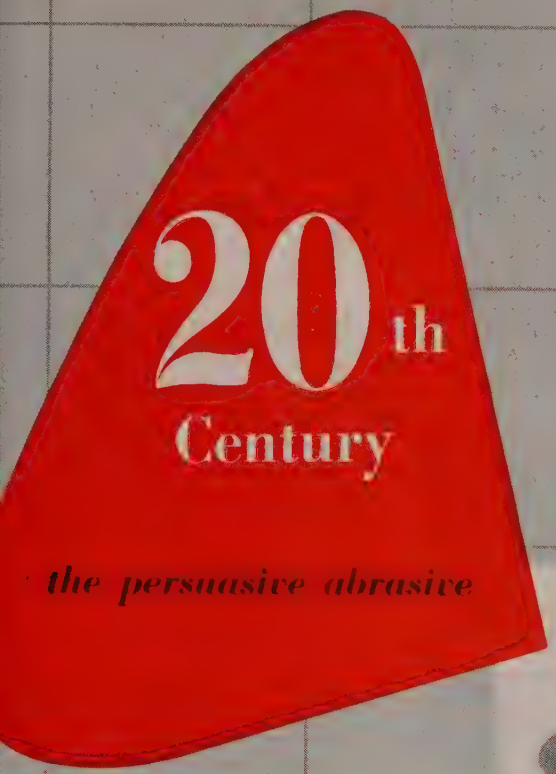

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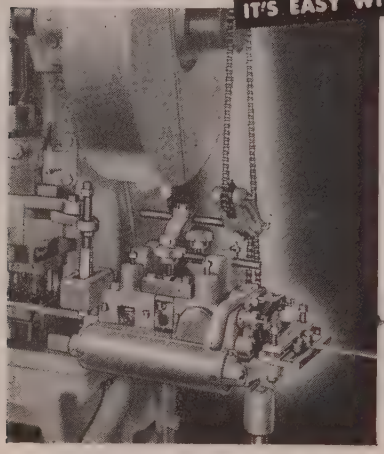

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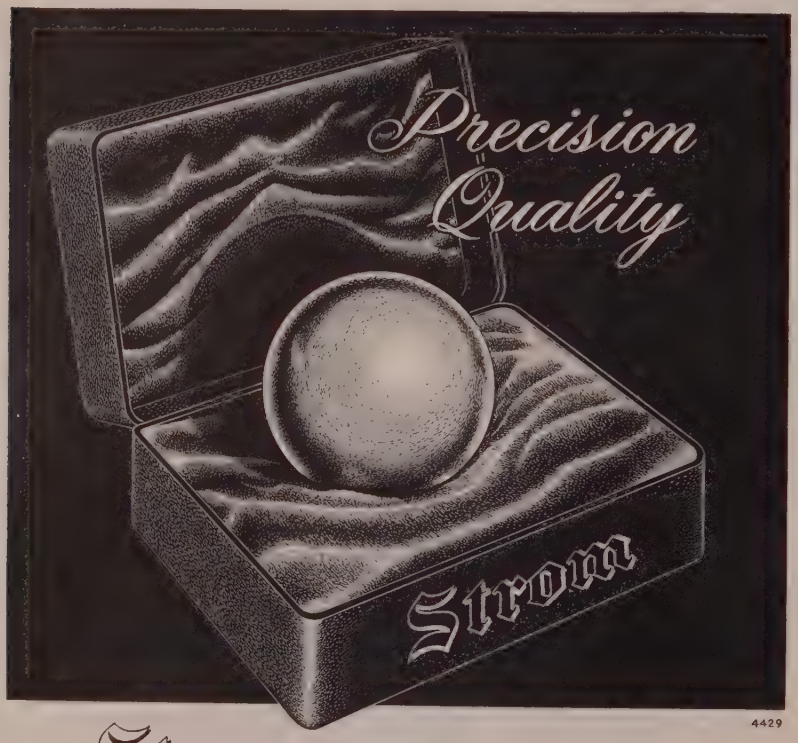

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Strom STEEL BALL CO.

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tober on smaller sizes of cold-finishe are prevalent.

Philadelphia—Bars are easing bit across-the-board. Some spots ca be found here and there on m books for early fourth quarter d livery, but popular sizes are take pretty well through November. hot-rolled bars the tone is softer some sizes of large flats and shape Rail steel bars are in good dema and this sector promises to be bus for some time.

Pittsburgh — Demand has falle from all consuming quarters for bar Especially hard hit are alloy bar Decline in ordering has been expec ed with bars easier to obtain. War houses are not buying far ahead the required time, and other consum ers are letting their inventories dro Only purchases reported by war houses are for filling in low point in their inventories.

Structural Shapes . .

Structural Shape Prices, Page 192

. .**Boston** — Volume of fabricate structural work is lower, but poten tial requirements are high, notabl bridges. Shop backlogs extend int second quarter with the larger units

Competition for new contracts growing. Plain material supply is im proving for long-range projects, a though frequently smaller lots ar placed on a delivery basis command ing a somewhat higher price for stee in place.

New York — Contracts for offic buildings and state highway bridge sustain bookings by structural fabri cating shops. Backlogs are as heav as last year with most shops, a though somewhat unbalanced, wit bridge work predominating. Approxi mately three-fourths of the tonnag required for the New York thruwa is now under contract. Includin the Tappan Zee bridge, this volum approximates 110,000 tons.

Philadelphia—Mills will be a littl behind on structural shapes at th end of the month. Wide flange beam will be a problem for some time Small contractors' shops are no filled up like those of the larger fab ricators causing them to compet strongly on delivery and price.

Most work up for bids is confine to minor building or plant additions schools and churches. This type o private work, running up to abou 150 tons, is the bread and butter o small shops. Highways will be a bi tonnage taker in the future. Bridg work continues strong. Advertise ments go out Sept. 16 for an esti mated 60,000 tons for the Philadel phia-Gloucester bridge over the Dela ware river for the Delaware Rive Port Authority.

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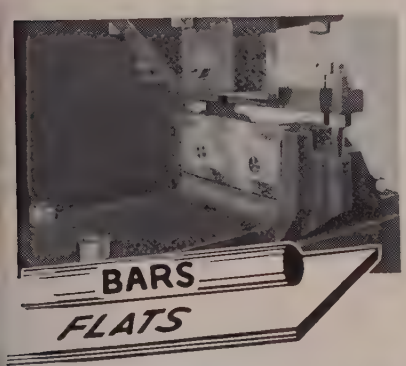

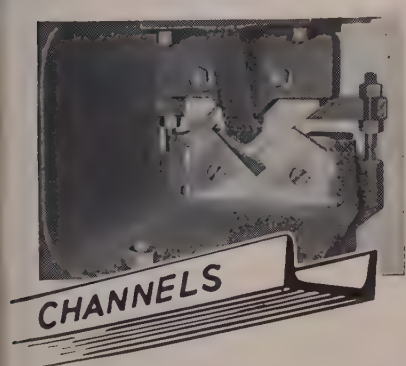

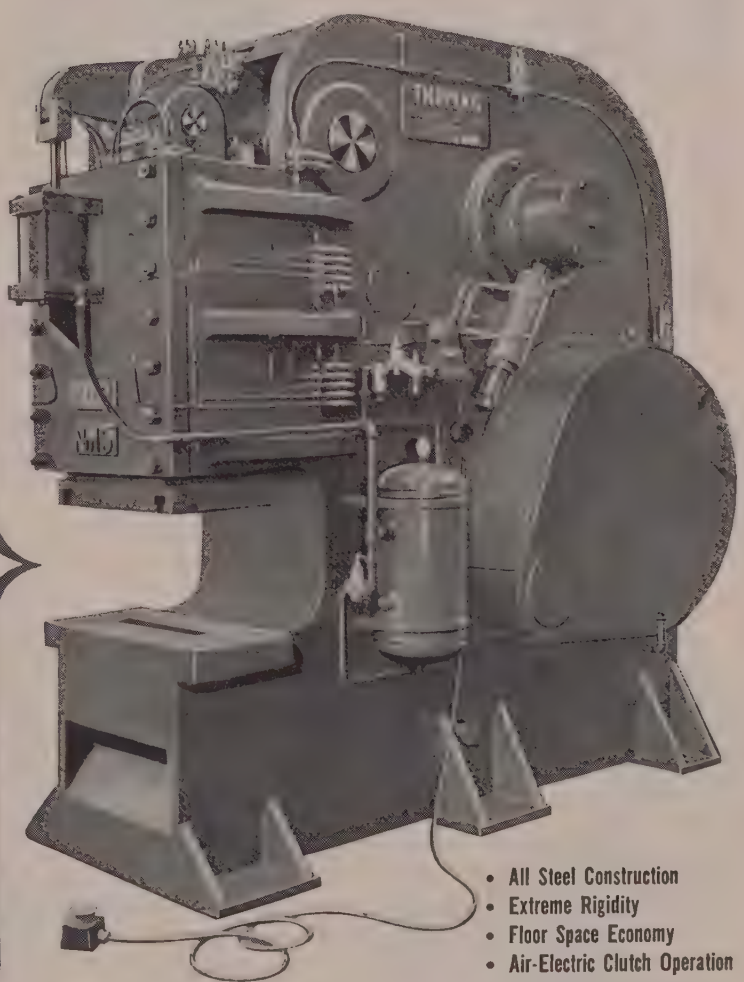

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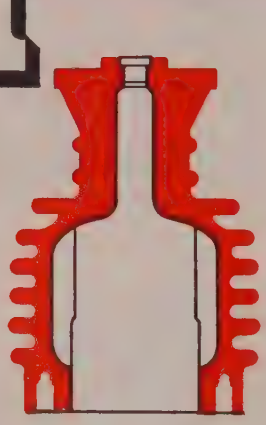

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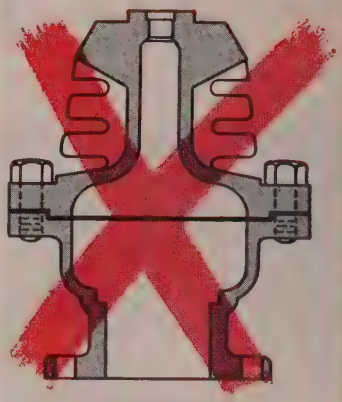

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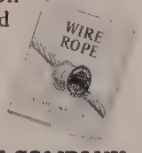

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Plates . . .

Plate Prices, Page 192

Philadelphia—Demand is less brisk for most sizes of plates. Going into fourth quarter order backlogs range from about current to one month's carryover. Sheared plate is about three weeks behind now and military setasides are expected to be reduced soon.

Tank builders are not pressing hard for material, and railroads' repair and car building programs are slipping. Distributors are more content with shipments. Some yards are busy on merchant ships but work on tankers is barely enough to keep going. Fabrication of oil industry equipment, such as cracking towers, is strong. Boiler people report an easing in a number of directions but high pressure boiler makers are going well and have backlogs running into 1954.

Boston — Producers with order books filled through the year could sell more tonnage if it were available, notably in heavier and wide sizes. Loss of volume from the sheet-strip mills keeps narrow and lighter gage plates in limited supply, although there is some improvement in shipments.

More plate producers are operating closer to schedule with less carryover in sight, but this is due to tight control on bookings to meet capacity openings.

New York—Light plates are still a much-sought-after product in this area, particularly the wide sizes. UM plates in narrow sizes have a softer tone, as do plates over 1-inch thick.

Pittsburgh — Quotas still govern the amount of tight plate and structural shapes consumers can obtain. Demand exceeds supply by a smaller margin than in second quarter. No easing in supply of heavy plates is predicted this year. Steady demand but less clamor exists for light plate.

Cobalt-60 Prices Slashed

Boston — Substantial price reductions on its cobalt-60 radiography sources are announced by Tracerlab Inc.

Prices now range from $160 for a 10 millicurie source to $600 for a 10 curie source. Former prices for comparable sources were $195 to $1,115.

Cobalt-60 sources are used by industry to test welds, castings, tank hulls, pressure vessels and other critical objects for flaws. They have been sold by the Boston company for two years and are one of the major industrial products developed as a result of America's atomic energy program.

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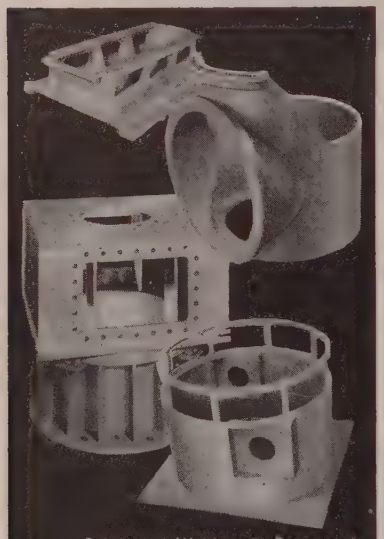

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Reinforcing Bars . . .

Reinforcing Bar Prices, Page 192

Los Angeles—Construction activity here shows no signs of sagging. Valuation of construction in Los Angeles for August was $38,501,497, 31 per cent more than in the like month last year.

Wire . . .

Wire Prices, Page 194

Boston—Absence of forward buying is emphasized by reluctance of wire consumers to place orders on normal lead-time basis. There are soft spots even in October schedules, and firm orders beyond that month are light. Buying of cold-heading wire is off 40 per cent and upholstery wire is moving slowly. Nail wire and rope requirements also are limited.

Philadelphia—Imports are pulling the rug from under domestic nail sellers. Reports here indicate foreign nails are being sold at $1.40 a keg under domestic levels.

Iron Ore . . .

Iron Ore Prices, Page 215

Cleveland—Iron ore continues to move down the lakes in heavy weekly volume. Shipments in the week ended Sept. 7 totaled 3,388,057 gross tons. The week's movement brought the 1953 season's total to date to 68,675,460 gross tons. This compares with 40,805,696 tons moved in the corresponding period of the 1952 season.

Pig Iron . . .

Pig Iron Prices, Page 196

Boston — Shipments are slightly heavier, volume having picked up with smaller jobbing shops. Machine tool requirements are close to capacity operations and some additional volume has resulted from the General Motors transmission shop fire. Textile equipment demand is well under capacity.

Buffalo—Pig iron production here plunged 42 points to 52 per cent of capacity last week as Bethlehem's Lackawanna plant banked seven blast furnaces because of a strike in the coke oven department.

Philadelphia—Pig iron is quite freely available here. Domestic sellers are quoting about $56 to $57 and German iron is giving them a run for their money at substantial price discounts. Most foundries remain loyal to local sellers because they are loathe to let go of established supply sources. Foundry operations are holding steady with fair orders reported.

Pittsburgh — Merchant pig iron

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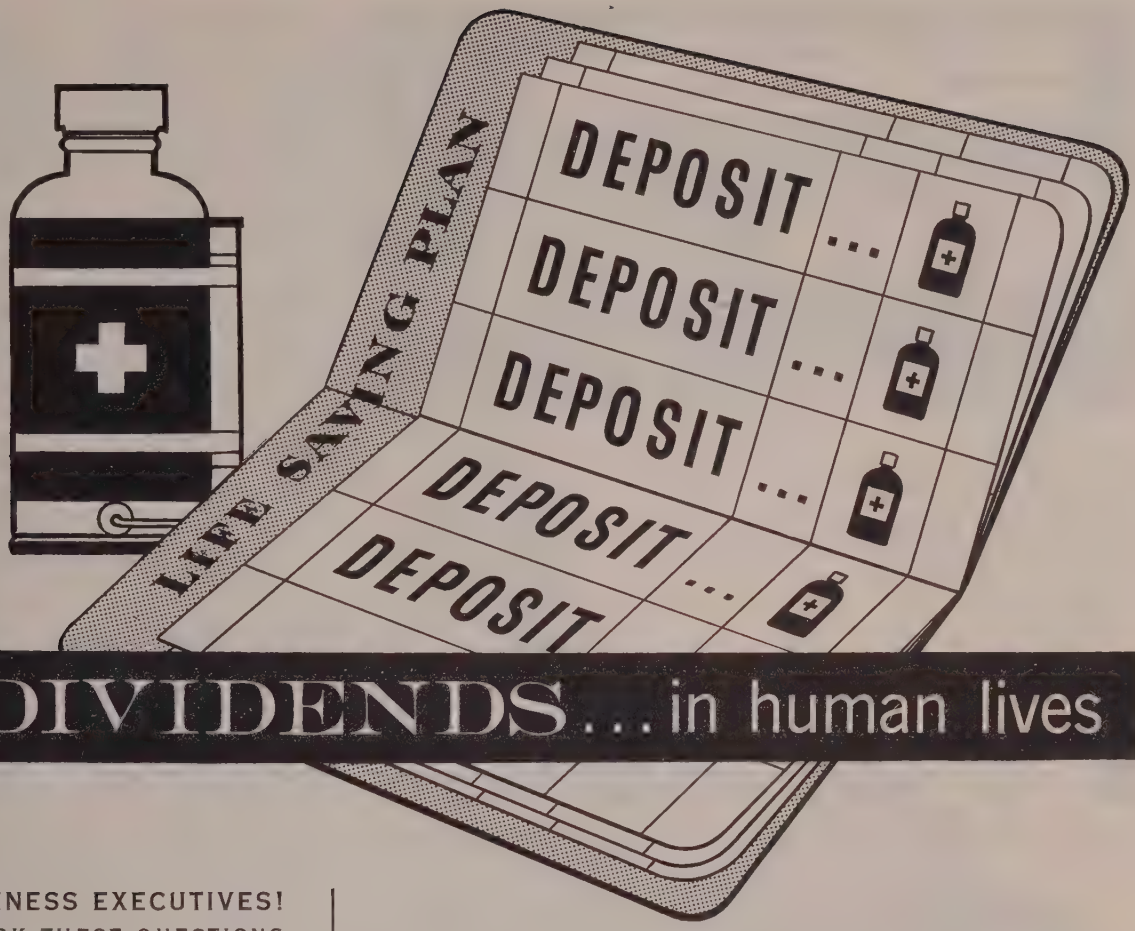

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- ◯ HAVE YOU INFORMED EMPLOYEES OF YOUR COMPANY'S PLAN OF CO-OPERATION?
- ◯ WAS THIS INFORMATION GIVEN THROUGH PLAN BULLETIN OR HOUSE MAGAZINE?
- ◯ HAVE YOU CONDUCTED A DONOR PLEDGE CAMPAIGN IN YOUR COMPANY?
- ◯ HAVE YOU SET UP A LIST OF VOLUNTEERS SO THAT EFFICIENT PLANS CAN BE MADE FOR SCHEDULING DONORS?

Remember, as long as a **single** pint of blood may mean the difference between life and death for **any** American . . . the need for blood is **urgent!**

NATIONAL BLOOD PROGRAM

America's blood bank needs **more** blood, **now**. Be a regular depositor and know that your dividend is saving a life of some American—somewhere.

It may be a soldier shot down in battle, suffering from **shock.** Or someone here at home, sick and in dire need of new blood to restore life. A mother in childbirth, or a child in an accident.

America must give. America is **you**. Won't you call your Red Cross, Armed Forces or Community Blood Donor Center right now, for an appointment?

GIVE BLOOD

...give it again and again

A 3 Motor-double girder floor controlled EUCLID CRANE underslung from 3 roof girders

This crane is ideal for buildings wherein headroom is a factor and maximum lateral movement is desired.

It's a three-motor, floor-controlled crane suspended from three I-beams. Note that the bridge clears the side columns by mere inches.

This permits the trolley to travel unusually close to the walls affording maximum use of the floor area.

There is a Euclid Crane to handle all conventional and unusual operations—or we'll design one to do the job.

EUCLID CRANES AND HOISTS Raise Profits

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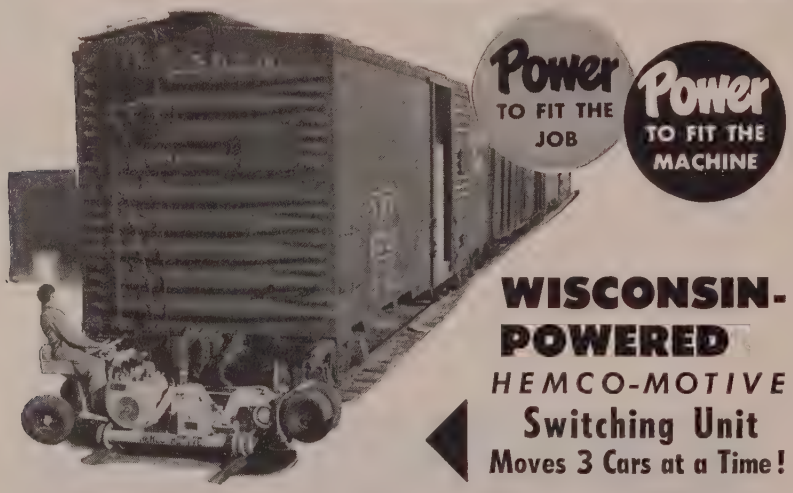

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Switching Unit

Moves 3 Cars at a Time!

Here's a practical "locomotive" for switching and spotting cars on your sidings — at a great saving in man-hours, plus increased safety and ever-ready convenience . . . at an operating cost of about 1½ gals. of gasoline per hour!

A 25 hp. Model VF4 Wisconsin Heavy-Duty Air-Cooled Engine furnishes dependable power for all phases of HEMCO-MOTIVE operation . . . off-track mobility, climbing up and over the rails, operating the hydraulic lift that "couples" the unit to the car, and handling all switching and spotting maneuvers . . . delivering a 7400-lb. drawbar pull through 4-wheel drive, moving up to 3 loaded freight cars at a time, at a rail speed of 150 ft. per minute! Hemco Manufacturing Inc., Argonia, Kansas, is the builder.

It's another typical Wisconsin Air-Cooled Engine original equipment application . . . again illustrating how these fine engines fit both the JOB and the MACHINE.

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WISCONSIN MOTOR CORPORATION

World's Largest Builders of Heavy-Duty Air-Cooled Engines

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shipments continue to decline. Ma customers are using more iron th they order, allowing inventories decrease. Ford Motor Co., Detro awarded a contract to Standard Bo er & Plate Iron Co., Pittsburgh, f relining blast furnace "C" at For River Rouge plant.

Scrap . . .

Scrap Prices, Page 218

Cleveland—The scrap market he is at a dead standstill. Local mi are not taking material and prac cally all of the tonnage moving going to the Valley. On the basis a substantial sale of low phos m terial and prices obtained on t latest railroad list the market steelmaking grades is off as much $5 per ton. Still lower prices are a tic:pated by some sellers before t market hits bottom though the vie is expressed in some circles that turnabout is likely in a month or s

For the most part cast scrap pric are nominally unchanged. While son report the market weak others no a definitely stronger tone developi in the foundry trade and expect t foundries to enter the market f substantial tonnage soon.

Boston — Prices on steelmakir scrap continue to sag, both heavy ar light grades. No. 2 bundles are o sharply and differentials betwee grades are more confused. New buy ing is light. Bids on 600 tons of b crops and plate scrap, watertown a senal, brought out an offer of $25.2 per ton, which price was rejected too low. The tonnage will be readve tised.

New York—On a minimum volum of buying by both mills and broker heavy melting steel scrap prices sti sag. As low as $27.50 has been pa for No. 2 heavy melting while No. is not above $30 in most transaction Lighter grades of steelmaking scra are stagnant and prices are nomin on the weaker side. Cast buying dull and there is no market for u stripped motor blocks.

Buffalo — Weakness and talk lower prices dominates the scra market as buying interest is nil an a leading mill consumer halted ingo production because of a strike.

Pittsburgh — Without substanti sales to establish prices, quotation are largely speculative here. Scra movement is dull now. One majo steel producer has dropped its scra buying for the last month. On th basis of estimates of the prevailin market, No. 1 heavy melting droppe $1 a ton—to $41 to $42. Other majo prices declined similarly.

Philadelphia—The scrap market i

(*Please Turn to Page* 211)

PITT CHEM STOPS Moisture and Atmospheric Corrosion on Structural Steel!

You could apply ordinary paints to exposed steel structures like this for the rest of your life without finishing the job. For by the time you've completed one end, moisture and corrosion have started to eat away at the other. It takes tough, durable materials like Pitt Chem Tar Base Coatings to do a lasting job.

Pitt Chem Tar Base Coatings are up to 10 times as thick as ordinary paints. They are economical and easy to apply. What's more, Pitt Chem Coatings are made from coal tar pitch—one of the most impervious materials ever employed to stop corrosion—and produced in a plant designed exclusively for the manufacture of coal tar coatings. If *you* have a corrosion problem involving steel, masonry, brick or stone surfaces, call on Pittsburgh . . . or see our catalog in Sweet's Plant Engineering File.

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PITT CHEM 105 AQUATAR—A Water Dispersion
PITT CHEM 106 TARMASTIC—Sealing Compound
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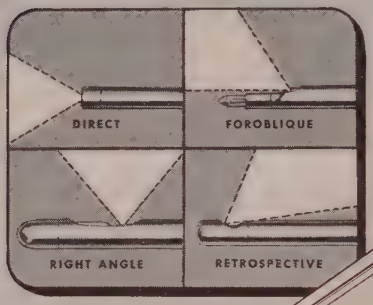

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The A.C.M.I. Borescopes permit close-up visual examination of interior areas and surfaces not otherwise visible. They save time and money, and prevent costly dismantling, by providing a practical solution to a wide variety of inspection problems.

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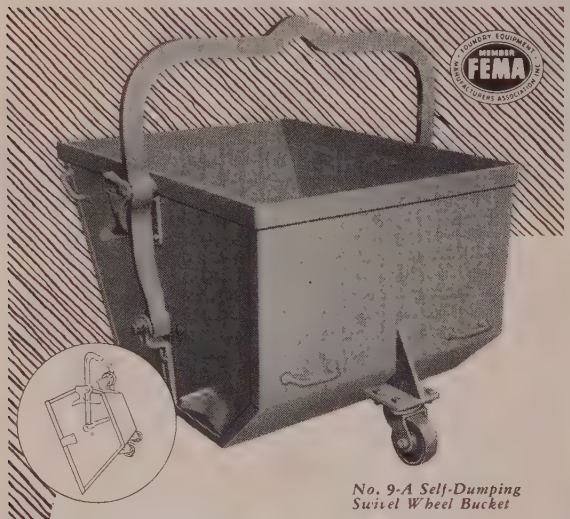

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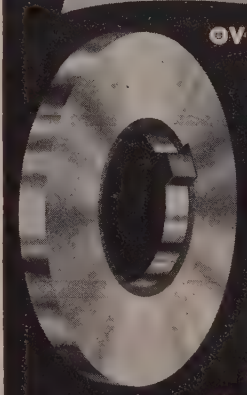

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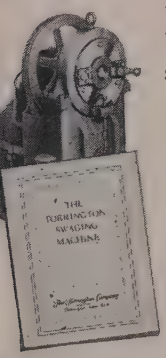
Torrington Swaging Machines produce pointed ends on both solid and tubular work to close tolerances. The swager, delivering 4000 hammer blows a minute, works rapidly and gives the metal toughness and resiliency. Swaging is economical, too, for there is no stock waste.



"The Torrington Swaging Machine" tells the story on the art of swaging and describes the complete line of Torrington machines. This informative booklet is yours for the asking.

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Makers of
TORRINGTON NEEDLE BEARINGS

Scrap . . .

(*Concluded from Page* 288)

falling flat on its face with prices off an average of $1.50 in another week of decline. When the market will round bottom, no one knows. Mills are taking in some industrial scrap but mighty little dealer scrap is being taken.

Sales of low phos material this month have been virtually nil, and no business has been transacted in electric furnace or No. 1 bundles. Dealers in turn are bringing very little scrap into their yards.

Detroit—The scrap market here continues weak. Only a few orders are reported for small quantities and pegging the market price is difficult.

Chicago—Two recent scrap purchases by a large steelmaker failed to stabilize prices and the market has suffered further easing up to $2 per ton. Good inventories and a lower steel output rate are factors which contribute to the slide. Further softening appears inevitable with brokers offering material at prices which shade last known sale prices. Affected in the latest decline are turnings and borings and foundry grades. The latter material is considered nominal with prices varying widely and hard to peg down. Adequate supply of pig iron and lower foundry operations are responsible.

St. Louis—Scrap prices continue to drop as mill consumers stay out of the market. Brokers see no resistance point until mills abandon their wait-and-see policy on the steel industry's fourth and first quarter outlook. They predict this will be in 30 to 45 days. Mill inventories are 60 to 90 days and buyers have shown no interest in laying in winter stocks.

The demand vacuum has broken No. 1 heavy melting steel prices $9 in the last two weeks and rerolling rails $10.

Birmingham—Scrap is moving sluggishly here. There is little buying and consumers in the North have cut their purchases sharply.

Los Angeles — Some dealers are tapering purchases of steelmaking scrap since the market exhibits little firmness.

Seattle — Scrap consumers hold comfortable inventories with receipts ample. Dealers anticipate no relief in the sluggish market unless the government grants export licenses permitting them to move a surplus of undesirable grades.

The local market is nominally $31 and $27 for No. 1 and No. 2 heavy melting respectively.

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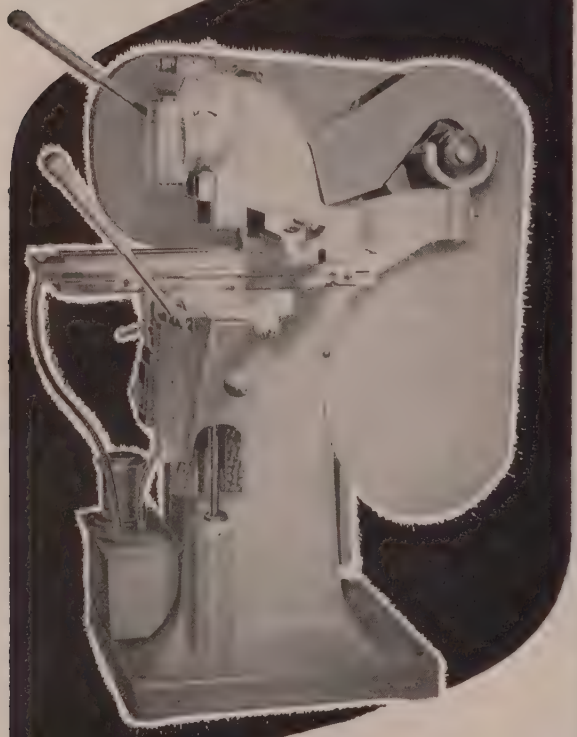

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Suggestions as to how a U. S. No. 1 Milling Machine can cut costs on your particular production needs, as well as complete data on the basic machine and attachments, gladly furnished on request.

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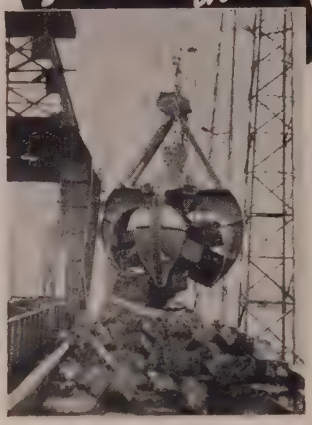

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That, roughly is the job which confronts yard operators today.

Every day more and more Owen Scrap Grapples are aiding in solving these problems.

Their independently acting tines dig deeply into the scrap of various kinds and lift capacity loads for vital defense uses.

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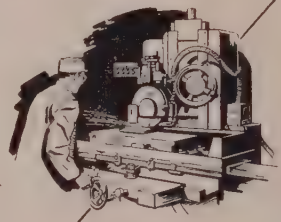

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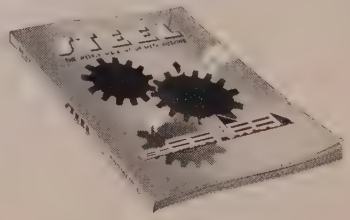

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CURRENT FERROALLOY QUOTATIONS

Prices as reported to STEEL

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton $86, Palmerton, Pa.; $87 Clairton and Duquesne, Pa.
(16 to 19% Mn) $84 per ton, Palmerton, Pa.; $85 per ton, Clairton and Duquesne, Pa.

Standard Ferromanganese: (Mn 74-76%, C 7% approx.) Base price per net ton $200, Clairton, Duquesne, Johnston and Sheridan, Pa.; add or subtract $2.00 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively.
(Mn 76-80%) 13.15c per pound of contained Mn, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; and Portland, Oreg.
(Mn 79-81%) Lump, $208 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 27.95c per lb of contained Mn, carload packed 28.7c, ton lots 29.8c, less ton 31.0c. Delivered. Deduct 0.5c for max, 0.15% C grade from above prices, 1c for max, 0.30% C, 1.5c for max 0.50% C, and 4.5c for max 7.5% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85, C 1.5% max). Carload, lump, bulk 21.35c per lb of contained Mn, carload packed 22.1c, ton lot 23.2c, less ton 24.4c. Delivered. Spot, add 0.25c.

Manganese metal, 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max. C 0.2% max): Carload, lump, bulk, 36.2c per lb of metal; packed, 36.95c; ton lot 38.45c; less ton lots 40.45c. Delivered. Spot, add 2c.

Electromanganese: Carload, 31.5c; ton lots 33.5c; 250 to 1999 lb, 35.5c. Premium for hydrogen-removed metal, 1.5c per pound, f.o.b. cars Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 11.4c per lb of alloy, carload packed, 12.15c, ton lots 13.05c, less ton 14.05c. Freight allowed. For 3% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.5c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 8.5% max. Si 4% max, C 0.10% max). Contract, ton lots 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lots $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot add 5c.

Ferrotitanium, High - Carbon: (Ti 15-18%, C 6-8%). Contract $177 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%.) Contract $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk 24.75c per lb of contained Cr; c.l., packed 25.65c, ton lot 26.80c, less ton 28.20c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%) Contract, carload, lump, bulk, max. 0.025% C (simplex) 34.50c per lb contained Cr, 0.03% C 35.50c, 0.04% C 35.50c, 0.06% C 34.50c, 0.10% C 34.00c, 0.15% C 33.75c, 0.20% C 33.50c, 0.50% C 33.25c, 1% C 33.00c, 1.50% C 32.85c, 2% C 32.75c. Carload packed add 1.1c, ton lot 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High Carbon: (Cr 62-66%, C 5-7%) Contract, c.l. 8 M x D, bulk, 26.25c per lb contained Cr. Packed, c.l. 27.15c, ton 28.50c, less ton 30.25c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, Low Carbon: (Cr 50-64%, Si 28-32%, C 1.25% max.) Contract, carload, packed, 8 M x D, 18.35c per lb of alloy; ton lot 19.2c; less ton lot, 20.4c, delivered; spot, add 0.25c.

Low-Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-49%, C 0.05% max.) Contract, carload, lump, 4" x down and 2" x down, bulk, 25.75c per lb of contained chromium plus 12.4c per pound of contained silicon; 1" x down, bulk 25.90c per pound of contained chromium plus 12.60c per pound of contained silicon. F.o.b. plant; freight allowed to destination.

Ferrochrome Silicon, No. 2: (Cr. 36-39%, Si 38-39%, Al 7-9%, C 0.05% max.) 25.75c per lb of contained chrome plus 12.4c per lb of contained silicon plus aluminum 3" x down, delivered.

Chromium Metal: (Min 97% Cr and 1% Fe) contract, 1" x D; packed, max 0.50%, carload $1.12, ton lots $1.14, less ton $1.16. Delivered. Spot, add 5c. Prices on 0.10 per cent carbon grade, add 4c to above prices.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 35-55%, Si 8-12% max, C 3-3.5% max). Contract, any quantity, $3.00 per lb of contained V. Delivered. Spot, add 10c. **Crucible-Special Grades** (V 35-55%, Si 2-3.5% max, C 0.5-1% max), $3.10. **Primos and High Speed Grades** (V 35-55%, 1.50% max, C 0.20% max) $3.20.

Grainal: Vanadium Grainal No. 1, $1 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lots $1.28 per lb contained V_2O_5, freight allowed Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si, packed 21.40c; ton lot 22.50c, f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 12.40c per lb of contained Si, carload packed 14.0c, ton lot 15.45c, less ton 17.1c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 14.3c per lb of contained Si, carload packed 15.6c, ton lot 16.75c, less ton 18.0c. Delivered. Spot, add 0.8c.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 17.0c per lb of contained Si, carload packed 18.2c, ton lot 19.15c, less ton 20.2c. Delivered. Spot, add 0.25c.

Silicon Metal: (Min 97% Si and 1% max Fe) C.l. lump, bulk, regular 18.5c per lb of Si, c.l. packed 19.7c, ton lot 20.6c, less ton 21.6c. Add 0.5c for max, 0.10% calcium grade. Deduct 0.5c for max 2% Fe grade analyzing min 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe) Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.90c per lb of alloy, ton lots packed 11.30c, 20 to 1999 lb 11.65c, smaller lots 12.15c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 30-43%, Fe 40-45%, C 0.20% max.). Contract, c.l. lump bulk 8.0c per lb of alloy, c.l. packed 8.75c, ton lot 9.5c, less ton 10.35c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Contract, carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed Spot add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more, 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over, are as follows: Grade A (10-14% B) 75c per pound; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si), $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%) contract, lump, carloads 9.50c per lb, f.o.b. Suspension Bridge, N. Y. freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 20.8c, ton lot 22.3c, less ton 23.3c. Delivered. Spot add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 19.0c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c. Deld. Spot add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 16.25c per lb of briquet, carload packed 16.95c, ton 17.75c, less ton 18.65c. Deld. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 12.45c per lb or briquet, c.l. packaged 13.25c, ton lot 14.05c, less ton 14.95c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 12.65c, per lb of briquet, c.l. packaged 13.45c, ton lot 14.25c, less ton 15.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size — weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.95c per lb of briquet. Packed c.l. 7.75c, ton lot 8.85c, less ton 9.45c. Delivered. Spot, add 0.25c.
(Small size—weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 7.1c. Packed c.l. 7.9c, ton lot 8.7c, less ton 9.6c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.14 per pound of Mo contained, f.ob. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%), 10,000 lb W or more, $4.35 per lb of contained W; 2000 lb W to 10,000 lb W, $4.45; less than 2000 lb W, $4.57, f.o.b. Niagara Falls, N. Y.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 8% max. C 0.4% max). Contract, ton lot, 2" x D, $6.40 per lb of contained Cb, less ton $6.45. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx. Ta 20% approx, and Cb and Ta 60% min, C 0.30% max) ton lots, 2" x D, $4.75 per lb of contained Cb plus Ta, deld.; less ton lots $4.80.

Silicaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carload packed, 1" x D, 45c per lb of alloy, ton lot 47c, less ton 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Contract, carload, packed, ½" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.5c. Deld. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 17.50c per lb of alloy; ton lots 18.50c; less ton lots 20c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 15c per lb of alloy; ton lots 16.50c; less ton lots 17.75c, f.o.b., Niagara Falls; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al; bal. Fe) Lump, carload, bulk 14.50c. Packed c.l. 15.50, ton lots, 15.75c, less ton lots, 16.25c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $3 for each 1% of P above or below the base); carloads, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $65 per gross ton.

Ferromolybdenum: (55-75%). Per lb contained Mo, f.o.b. Langeloth, $1.32 in all sizes except powdered which is $1.41; Washington, Pa., furnace, any quantity $1.32.

Technical Molybdic-Oxide: Per lb, contained Mo, f.o.b. Langeloth, Pa., $1.14 in cans; in bags, $1.13, f.o.b. Langeloth, Pa.; Washington, Pa., $1.13.

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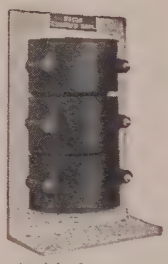

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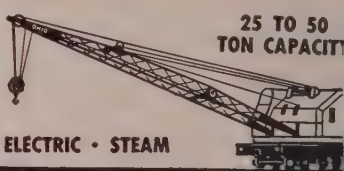

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ORES-COKE-REFRACTORIES

Prices as reported to STEEL; changes shown in italics.

ORES

Lake Superior Iron Ore

(Prices effective July 1, 1953, and thereafter; gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Old range bessemer	$10.30
Old range nonbessemer	10.15
Mesabi bessemer	10.05
Mesabi nonbessemer	9.90
Open-hearth lump	11.15
High phosphorus	9.90

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon which were in effect on June 24, 1953, and increases or decreases after such date are for buyer's account.

Eastern Local Iron Ore

Cents per unit del. E. Pa.

Foundry and basic 56-62% concentrates contract 17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	nom.
Long-term contract	22.00
North African hematites (spot)	24.00-26.00
Brazilian iron ore, 68-69% (spot)	25.00

Tungsten Ore

Net ton unit, duty paid

Foreign wolframite and scheelite, per net ton unit	$55.00
Domestic scheelite, mine	63.00

Manganese Ore

Manganese, 48% nearby, $1.18-1.21 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; shipments against old contracts for 48% ore are being received from some sources at 90-93c.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African

48% 2.8:1	$40.00-$42.00
48% 3:1	44.00-46.00
48% no ratio	32.00-34.00

South African Transvaal

44% no ratio	$27.00-28.00
48% no ratio	34.00-35.00

Brazilian

44% 2.5:1 lump	nom. $32

Domestic

(Rail nearest seller)

48% 3:1	$39.00

Molybdenum

Sulphide concentrates per lb. molybdenum content, mines $1.00

REFRACTORIES

Fire Clay Brick

High-Heat Duty: Pueblo, Colo., $89.00; Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lochhaven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., Woodbridge, N. J., $109.00; Salina, Pa., $114.00; Niles, O., $120; Los Angeles, Pittsburg, Calif., $132.30.

Silica Brick

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., $115.00; Hays, Pa., $120.00; Niles, O., $123; E. Chicago, Ind., Joliet, Rockdale, Ill., $125.00; Cutler, Utah, $116.55, Los Angeles, $122.85.

Insulating Fire Brick

2300° *F:* Massillon, O., $178.50; Clearfield, Pa., $197.50; Augusta, Ga., Beaver Falls, Zelienople, Pa., Mexico, Mo., $186.90.

Ladle Brick

Dry Pressed: Bessemer, Ala., $64.60; Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Wellsville, O., $77.50; Mexico, Mo., $73.50; Clearfield, Pa., Portsmouth, O., $83; Perla, Ark., $109.00; Los Angeles, $110.25; Pittsburg, Calif., $111.30.

Sleeves

Reesdale, Pa., $139.70; Johnstown, Pa., $140.00; Clearfield, Pa., $148.50; St. Louis, $151.80; Athens, Tex., $155.00.

Nozzles

Reesdale, Pa., $223.50; Johnstown, Pa., $229.20; Clearfield, Pa., $241.40; St. Louis, $247.10; Athens, Tex., $247.70.

Runners

Reesdale, Pa., $174.00; Johnstown, Pa., $177.80; Clearfield, Pa., $185.50; St. Louis, $187.30; Athens, Tex., $191.80.

High-Alumina Brick

50 *Per Cent:* Clearfield, Pa., St. Louis, Mexico, Mo., $179.00; Danville, Ill., $169.30.
60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $223.00; Danville, Ill., $213.20.
70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $255.00; Danville, Ill., $258.00; Clearfield, Pa., $252.

Dolomite

Domestic, dead-burned bulk; Billmeyer, Blue Bell, Williams, Plymouth Meeting, Pa., Millville, W. Va., Millersville, Martin, Gibsonburg, Woodville, O., $13.75; Thornton, McCook, Ill., $13.85; Dolly Siding, Bonne Terre, Mo., $13.65; Narlo and Bettsville, O., $14.50.

Magnesite

Domestic, deadburned bulk; Luning, Nev., $38.

METALLURGICAL COKE

Price per net ton

Beehive Ovens

Connellsville, furnace	$14.50-15.00
Connellsville, foundry	16.50-17.00
New River foundry	20.80
Wise county foundry	15.95
Wise county, furnace	15.20

Oven Foundry Coke

Kearney, N. J. ovens	$24.00
Everett, Mass., ovens	
New England, del.	*26.00
Chicago ovens	24.50
Chicago, del.	26.00
Terre Haute, ovens	24.05
Milwaukee, ovens	25.25
Indianapolis, ovens	24.25
Chicago, del.	28.12
Cincinnati, del.	25.85
Painesville, O., ovens	25.50
Cleveland, del.	27.43
Erie, Pa., ovens	25.00
Birmingham, ovens	21.65
Cincinnati, del.	26.58
Lone Star, Tex., ovens	18.50
Philadelphia, ovens	23.95
Swedeland, Pa., ovens	23.85
St. Louis, ovens	
St. Louis, del.	26.00
St. Paul, ovens	23.75
Portsmouth, O., ovens	24.00
Cincinnati, del.	26.62
Detroit, ovens	25.50
Detroit, del.	26.50
Buffalo, del.	28.08
Flint, del.	28.23
Pontiac, del.	27.06
Saginaw, del.	28.58

*Or within $4.55 freight zone from works.

COAL CHEMICALS

Spot, cents per gallon, ovens

Pure benzol	36.00
Toluol, one deg.	30.00-33.00
Industrial xylol	30.00-33.50

Per ton, bulk, ovens

Sulphate of ammonia	$44-45
Birmingham area	$49.50

Cents per pound, ovens

Phenol, 40 (carlots, nonreturnable drums)	17.25

FLUORSPAR

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $44; 70%, $42.50; 60%, $38. Imported, net ton, duty paid, metallurgical grade, $35-$36.

ELECTRODES

(Threaded, with nipples, unboxed f.o.b. plant)

Inches Diam.	Length	Cents per lb
GRAPHITE		
17,18,20	60,72	17.85
8 to 16	48,60,72	17.85
7	48,60	19.57
6	48,60	20.95
CARBON		
35,40	110	8.03
30	65,84,110	8.03
24	72 to 104	8.03
17 to 20	34,90	8.03

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Metallurgical Coke . . .

Metallurgical Coke Prices, Page 215

Philadelphia—An exterior factor in the coke situation is natural gas, a situation akin to imports affecting foundry iron. By-product coke plants are facing the fact that natural gas is cutting into their market considerably.

Canada . . .

Toronto, Ont.—Production of iron and steel in Canada continues to show gains over last year. For June, production of steel ingots and castings amonuted to 352,463 net tons.

For the first six months production totaled 2,123,406 net tons, including 2,066,278 tons of steel ingots and 57,128 tons of steel castings.

Pig iron production in June was 266,180 net tons for a daily average of 93.7 per cent of capacity.

Production of pig iron for the first six months this year totaled 1,487,584 net tons.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

3200 tons, office building, 1430 Broadway, New York, to Harris Structural Steel Co., that city; Cauldwell-Wingate Co., New York, general contractor.

1280 tons, office building, 30 Wall St., New York, to American Bridge Division, U. S. Steel Corp., Pittsburgh; Robert H. Waters Co., general contractor.

2585 tons, bridges, New York thruway, Orange county, to Lehigh Structural Steel Co., Allentown, Pa.

2245 tons, bridges, Hudson thruway, Rockland county, New York, to American Bridge Division, U. S. Steel Corp., Pittsburgh; L. G. DeFelice & Son Inc., New Haven, Conn., general contractor.

535 tons, Products Division laboratory, General Electric Co., Schenectady, N. Y., to Belmont Iron Works, Norristown, Pa.

415 tons, memorial and cripled childrens' hospital, Roanoke, Va., to American Bridge Division, U. S. Steel Corp., Roanoke, Va.; B. Parrott & Co. Inc., Roanoke, general contractor; 65 tons, reinforcing steel, to Virginia Steel Co., Richmond, Va.

350 tons, cold storage building and packing plant, Memphis Packing Co., Memphis, Tenn., to Tri-State Iron Works, Memphis, (structurals) and LaClede Steel Co., St. Louis, (reinforcing); Southern Builders Inc., Memphis, general contractor.

140 tons, bridge, Cutter Mill road, Great Neck, N. Y., to Bethlehem Steel Co.; William Casey & Sons, general contractors.

105 tons, Townsend school, Wakton, N. Y., White Plains Iron Works, White Plains, N. Y.; Constructors Co. Inc., general contractor.

STRUCTURAL STEEL PENDING

1120 tons, E. Capitol St. bridge, Washington, D. C.; A. S. Wichstron, general contractor.

940 tons, state bridges, Hepburn-Lewis townships, Pennsylvania; bids Sept. 18, Harrisburg, Pa.

935 tons, bridge, Lycoming county, Lewis township, Pennsylvania; due Sept. 18, Pennsylvania Department of Highways & Bridges.

730 tons, grade crossing eliminations, Central Railroad of New Jersey, Plainfield and Dunnellen, N. J.; bids in.

420 tons, state bridges, York county, Pennsylvania; bids Sept. 18, Harrisburg, Pa.; also 75 tons reinforcing bars.

330 tons, Washington state, Watcom county, truss bridge; also 55 tons of reinforcing; bids in.

200 tons, also 60 tons reinforcing, Montana state, 686-ft bridge, Flathead county; general contract to James Crick, Spokane, Wash., low $497,909.

REINFORCING BARS . . .

REINFORCING BARS PLACED

380 tons, high school, Anchorage, Alaska, to Northwest Steel Rolling Mills Inc., Seattle; Patti-MacDonald Co., general contractor.

200 tons, hangar and facilities, Logan International Airport, East Boston, Mass., to Concrete Steel Co., Boston; Farina Bros. Co., Newton, Mass., general contractor. Groisser & Shlager Iron Works, Somerville, Mass., will fabricate 1000 tons, structural steel.

175 tons, elementary school buildings, Warwick, R. I., to Plantations Steel Co., Providence, R. I.; Dimeo Construction Co., Providence, general contractor; Tower Iron Works, Providence, fabricated structural steel.

160 tons, country day school, Weston, Mass., to Joseph T. Ryerson & Sons Inc., Cambridge, Mass.; J. A. Singarella Co., Boston, general contractor.

140 tons, three 50-ft. rolled span beam bridges, Windsor, Conn., to Plantations Steel Co., Providence, R. I.; Brunali Construction Co., Southington, Conn , general contractor.

133 tons, Gonzaga College dormitory, Spokane, Wash., to unstated Spokane supplier.

125 tons, Aurora avenue underpass, Seattle, to Northwest Steel Rolling Mills Inc., Seattle; Morrison-Knudsen Co., general contractor.

REINFORCING BARS PENDING

1240 tons, grading, drainage and structures, Ohio Turnpike Commission, Cuyahoga-Lorain counties, Ohio; bids Sept. 18, Ohio Turnpike

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AMBLER, PA.

Commission, Columbus; also 550 tons highway mesh.

875 tons, bridge, Ohio turnpike, Sandusky and Erie counties, Ohio; bids Sept. 18, Ohio Turnpike Commission, Columbus, also 750 tons, highway mesh.

550 tons, Umatilla county, Oregon, bridge; bids in at Pendleton, Oreg.

235 tons, bridges, Route 21, section 4D, Newark, N. J.; bids in.; also 330 tons, fabricated structural steel.

235 tons, Washington state highway project, Pacific, Pierce, Lewis and Franklin counties; bids to Olympia, Sept. 22.

225 tons, Washington state highway bridge, Snohomish county; bids in at Olympia.

220 tons, addition to Washington state Medical Lake Hospital; bids in at Olympia, Wash.

220 tons, addition to Washington state Medical Lake hospital; bids in at Olympia.

220 tons, Washington state highway overcrossing, Thurston county; bids in.

115 tons, bridges and highway, Hepburn-Lewis townships, Pennsylvania; bids Sept. 18, Harrisburg, Pa.

100 tons, including shapes, bridge ramp; bids to Tacoma, Wash., Sept. 4.

PIPE . . .

CAST IRON PIPE PLACED

1500 tons, 8 and 12-in., Metropolitan District Commission, Hartford, Conn., to Warren Foundry & Pipe Co., Everett, Mass.

600 tons, 16 and 20-in., Rutland, Vt., to United States Pipe & Foundry Co., Burlington, N. J.

135 tons, Seattle City Light Department, and Quincy, Wash., to Pacific States Cast Iron Pipe Co., Seattle.

115 tons, 18-in., for dock construction, Ketchikan, Alaska, to H. G. Purcell, Seattle.

100 tons, system expansion, Morton, Wash., to Pacific States Cast Iron Pipe Co., Seattle.

100 tons, 8 and 6-in., system expansion, Moses Lake, Wash., airport, to Pacific States Cast Iron Pipe Co., Seattle.

CAST IRON PIPE PENDING

100 tons, 10 and 8 in., cast iron pipe, system improvement; bids to North Bend, Oreg., Sept. 10.

PLATES . . .

PLATES PLACED

390 tons, two storage tanks, Vallentine Oil Co., Jersey City, N. J., to Bethlehem Steel Co.

150 tons, 350,000-gal. elevated water tank, Elgin Air Field Base to R. D. Cole Mfg. Co., Newman, Ga., through Corps of Engineers, Mobile, Ala.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Reading, 24 diesel locomotive units, Fairbanks, Morse & Co., Chicago, five 2400-hp units; Electro-Motive Division, General Motors Corp., twelve 1500-hp switchers; and American Locomotive-General Electric, Schenectady, N. Y., seven 1600-hp switchers.

RAILROAD CARS PLACED

Atchison, Topeka & Santa Fe, six full-length dome passenger cars to The Budd Co., Philadelphia.

Bangor & Aroostook, five 50-ton cushion underframe box cars to Pullman-Standard Car Mfg. Co., Chicago.

Chesapeake & Ohio, five 70-ton hoppers to own shops, Russell, Ky.

Chicago, Milwaukee, St. Paul & Pacific, 100 seventy-ton hopper cars to Pullman-Standard Car Mfg. Co., Chicago.

Clinchfield, one-hundred 50-ton box cars to American Car & Foundry Co.

Gulf, Mobile & Ohio, ninety 50-ton flats and one 140-ton depressed center flat, to own shops, Bloomington, Ill.

Missouri-Kansas-Texas, 25 fifty-ton flat cars to American Car & Foundry Co., New York.

Missouri Pacific, one-hundred 50-ton pulp wood cars to own DeSoto shops.

Seaboard Air Line, two-hundred 70-ton hoppers to Bethlehem Steel Co., Bethlehem, Pa.

Southern, seventy-five 70-ton flats with roller bearings to Thrall Car Mfg. Co.

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IRON AND STEEL SCRAP

Consumer prices, per gross ton, except as otherwise noted, including broker's commissions, as reported to STEEL. Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

Sept. 10	$38.67
Sept. 3	40.50
Aug. avg.	43.40
Sept. 1952	43.00
Sept. 1948	43.33

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

(Delivered consumer plant)

No. 1 heavy melting	*41.00-42.00*
No. 2 heavy melting	*37.00-38.00*
No. 1 bundles	*41.00-42.00*
No. 2 bundles	*35.00-36.00*
No. 1 busheling	*41.00-42.00*
Machine shop turnings	*25.00-24.00*
Mixed borings, turnings	*28.00-29.00*
Short shovel turnings	*29.00-30.00*
Cast iron borings	*28.00-29.00*
Cut structurals	46.00-47.00
Heavy turnings	40.00-41.00
Punchings & plate scrap	47.00-48.00
Electric furnace bundles	45.00-46.00

Cast Iron Grades

No. 1 cupola	41.00-42.00
Charging box cast	40.00-41.00
Heavy breakable cast	38.00-39.00
Unstripped motor block	34.00-35.00
No. 1 machinery cast	48.00-49.00

Railroad Scrap

No. 1 R.R. heavy melt	44.00-45.00
Rails, 2-ft. and under	51.00-52.00
Rails, 18-in. and under	47.00-48.00
Rails, random lengths	47.00-48.00
Railroad specialties	48.50-49.50

CLEVELAND

(Delivered consumer plant)

No. 1 heavy melting	*35.00-36.00*
No. 2 heavy melting	*32.00-33.00*
No. 1 bundles	*35.00-36.00*
No. 2 bundles	*32.00-33.00*
No. 1 busheling	*35.00-36.00*
Machine shop turnings	*20.00-21.00*
Mixed borings, turnings	*24.00-25.00*
Short shovel turnings	*24.00-25.00*
Cast iron borings	*24.00-25.00*
Low phos.	*38.00-39.00*
Alloy free, short shovel turnings	*27.00-28.00*
Electric furnace bundles	*37.00-38.00*

Cast Iron Grades

No. 1 cupola	*41.00-42.00*
Charging box cast	*39.00-40.00*
Stove plate	40.00-41.00
Heavy breakable cast	35.00-36.00
Unstripped motor blocks	25.00-26.00
Brake shoes	35.00-36.00
Clean auto cast	42.00-43.00
No. 1 wheels	37.00-38.00
Burnt cast	32.00-33.00
Drop broken machinery	45.00-46.00

Railroad Scrap

No. 1 R.R. heavy melt	*41.00-42.00*
R.R. Malleable	*45.00-46.00*
Rails, 3-ft. and under	51.00-52.00
Rails, 18 in. and under	52.00-53.00
Rails, random lengths	44.00-45.00
Cast steel	*43.00-44.00*
Railroad specialties	*46.00-47.00*
Uncut tires	*45.00-46.00*
Angles, splice bars	*46.00-47.00*
Rails, rerolling	*51.00-52.00*

YOUNGSTOWN

(Delivered consumer plant)

No. 1 heavy melting	*39.00-40.00*
No. 2 heavy melting	*34.00-35.00*
No. 1 bundles	41.00-42.00
No. 2 bundles	*33.00-34.00*
Machine shop turnings	*21.00-22.00*
Short shovel turnings	*27.00-28.00*
Cast iron borings	*27.00-28.00*
Low phos.	*45.00-46.00*
Electric furnace bundles	*40.00-41.00*

Railroad Scrap

No. 1 R.R. heavy melt	*42.00-44.00*

PHILADELPHIA

(Delivered consumer plant)

No. 1 heavy melting	*38.50-39.50*
No. 2 heavy melting	*34.50-35.50*
No. 1 bundles	*38.50-39.50*
No. 2 bundles	*32.00-33.00*
No. 1 busheling	*38.50-39.50*
Electric furnace bundles	*38.50-39.50*
Machine shop turnings	*23.50-24.50*
Mixed borings, turnings	*28.00-29.00*
Short shovel turnings	*29.00-30.00*
Structurals & plate	*43.50*
Heavy turnings	*39.00*
Couplers, springs, wheels	*46.50-47.50*

Cast Iron Grades

No. 1 cupola	*36.00-37.00*
Charging box cast	*37.00-38.00*
Heavy breakable cast	*38.50-39.50*
Unstripped motor blocks	*nom.*
Drop broken machinery	*44.50*

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	*30.00-31.00*
No. 2 heavy melting	*27.50-28.00*
No. 1 bundles	*30.00-31.00*
No. 2 bundles	25.00-26.00
Machine shop turnings	16.00-17.00
Mixed borings, short turnings	19.00-20.00
Low phos. (structural & plate)	*33.00-34.00*
Short shovel turnings	20.00-21.00

Cast Iron Grades

No. 1 cupola	32.00-33.00
Unstripped motor blocks	24.00-25.00

DETROIT

No. 1 heavy melting	*34.00-35.00*
No. 2 heavy melting	*26.00-27.00*
No. 1 bundles	*36.50*
No. 2 bundles	*26.50*
No. 1 busheling	33.00-34.00
Machine shop turnings	16.00
Mixed borings turnings	*16.00*
Short shovel turnings	*17.00*
Punchings & plate scrap	37.00-38.00

Cast Iron Grades

No. 1 cupola	43.00
Charging box cast	34.00-35.00
Stove plate	34.00-35.00
Heavy breakable	29.00-30.00
Unstripped motor blocks	30.00
Clean auto cast	42.00-43.00
Malleable	44.00

CINCINNATI

(Brokers' buying prices)

No. 1 heavy melting	38.00
No. 2 heavy melting	35.00
No. 1 bundles	38.00
No. 2 bundles	32.00
No. 1 busheling	38.00
Machine shop turnings	17.00*
Mixed borings, turnings	20.00*
Short shovel turnings	21.00*
Cast iron borings	20.00*

Cast Iron Grades

No. 1 cupola	44.00
Charging box cast	40.00
Heavy breakable cast	38.00
Drop broken machinery	49.00

Railroad Scrap

No. 1 R.R., heavy melt	42.00
Malleable	47.00
Rails, 18-in. and under	54.00
Rails, random lengths	46.00

*F.o.b. shipping point.

CHICAGO

No. 1 heavy melting	*35.00-36.00*
No. 2 heavy melting	*30.00-32.00*
No. 1 factory bundles	*35.00-36.00*
No. 1 dealer bundles	*34.00-35.00*
No. 2 bundles	*29.00-30.00*
No. 1 busheling	*35.00-36.00*
Machine shop turnings	*17.00-18.00*
Mixed borings, turnings	*17.00-18.00*
Short shovel turnings	*18.00-19.00*
Cast iron borings	*18.00-19.00*
Cut Structurals, 3-ft.	*41.00-43.00*
Punchings & plate scrap	*41.00-43.00*
Electric furnace bundles	*42.00-43.00*

Cast Iron Grades

No. 1 cupola	*34.00-36.00*
Stove plate	*32.00-34.00*
Unstripped motor blocks	*31.00-33.00*
Clean auto cast	*41.00-43.00*
Drop broken machinery	*40.00-42.00*

Railroad Scrap

No. 1 R.R. heavy melt	37.00-38.00
R.R. Malleable	*42.00-44.00*
Rails, 2-ft. and under	*48.00-50.00*
Rails, 18-in. and under	*49.00-51.00*
Angles, splice bars	*46.00-48.00*
Rails, rerolling	*51.00-53.00*

BIRMINGHAM

No. 1 heavy melting	*26.00-26.50*
No. 2 heavy melting	*24.00-24.50*
No. 1 bundles	*26.00-26.50*
No. 2 bundles	*22.00-22.50*
Machine shop turnings	*19.50-20.50*
Short shovel turnings	*21.50-22.50*
Cast iron borings	*17.00-17.50*
Cut structurals	*nom.*
Electric furnace bundles	*nom.*

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	*41.00-42.50*
Charging box cast	30.00-31.00
Stove plate	*38.00-39.00*
Bar crops and plate	*38.00-39.00*
Cut structurals	*36.00-37.00*
Heavy breakable cast	30.00-31.00
Unstripped motor blocks	34.00-35.00
No 1 wheels	46.00-47.00

Railroad Scrap

No. 1 R.R. heavy melt	*nom.*
Rails, 2-ft and under	*42.00-43.00*
Rails, random lengths	*39.00-40.00*
Angles, splice bars	45.00-46.00
Rails, rerolling	*46.00-47.00*

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	*34.00-35.00*
No. 2 heavy melting	*29.00-31.00*
No. 1 bundles	*34.00-35.00*
No. 2 bundles	*25.00-26.00*
Machine shop turnings	*15.00-16.00*
Short shovel turnings	*17.00-19.00*

Cast Iron Grades

No. 1 cupola	41.00-42.00
Charging box cast	*30.00-31.00*
Heavy breakable cast	*29.00-30.00*
Unstripped motor blocks	*29.00-30.00*
Brake shoes	*39.00-40.00*
Clean auto cast	*38.00-40.00*
Burnt cast	*29.00-30.00*

Railroad Scrap

Malleable	42.00-43.00
Rails, 18-in. and under	*47.00-48.00*
Rails, random lengths	*40.00-42.00*
Uncut tires	*42.00-43.00*
Angles, splice bars	*43.00-45.00*
Rails, rerolling	*42.00-43.00*

BUFFALO

No. 1 heavy melting	41.00-42.00
No. 2 heavy melting	37.00-37.50
No. 2 bundles	35.00-35.50
No. 1 bundles	42.00-43.00
No. 1 busheling	42.00-43.00
Machine shop turnings	23.00-24.00
Mixed borings, turnings	27.50-28.00
Short shovel turnings	28.50-29.00
Cast iron borings	28.50-29.00
Low phos.	45.00-46.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	38.00-38.50
No. 1 machinery	42.00-42.50

Railroad Scrap

Rails, random lengths	46.50-47.00
Rails, 2 ft and under	51.50-52.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*28.50-29.00*
No. 2 heavy melting	*24.00-24.50*
No. 1 bundles	*28.50-29.00*
No. 2 bundles	*22.00-22.50*
Machine shop turnings	*13.00-13.50*
Mixed borings, turnings	*18.00-18.50*
Short shovel turnings	*18.50-19.00*
No. 1 cast	30.00-31.00
Mixed cupola cast	26.00-28.00
No. 1 machinery cast	38.00-39.00

SEATTLE

(Delivered consumer plant)

No. 1 heavy melting	*31.00*
No. 2 heavy melting	*27.00*
No. 1 bundles	29.00
No. 2 bundles	23.00
No. 3 bundles	19.00
Machine shop turnings	14.00
Mixed borings, turnings	14.00
Short shovel turnings	14.00
Electric furnace, No. 1	38.00-40.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	30.00-35.00
Heavy breakable cast	25.00-30.00
Unstripped motor blocks	27.00
No. 1 wheels	38.00-40.00
Stove plate	26.00

Railroad Scrap

Rails, random lengths	34.00-35.00

SAN FRANCISCO

No. 1 heavy melting	28.00
No. 2 heavy melting	24.00
No. 1 bundles	25.00
No. 2 bundles	22.00
No. 1 busheling	28.00
Machine shop turnings	10.00
Mixed borings, turnings	29.00
Short shovel turnings	29.00
Cast iron borings	29.00
Cut structurals	38.00
Heavy turnings	34.00
Punching & plate scrap	37.50
Electric furnace bundles	37.00

Cast Iron Grades

No. 1 cupola	39.00
Charging box cast	47.00
Stove plate	46.00
Heavy breakable cast	45.00
Unstripped motor blocks	41.00
Brake shoes	41.00
Clean auto cast	52.00
No. 1 wheels	47.00
Burnt cast	41.00
Drop broken machinery	52.00

Railroad Scrap

No. 1 R.R. heavy melt	37.00
Malleable	55.00
Rails, 3-ft and under	42.00
Rails, 18-in. and under	45.00
Rails, random lengths	39.00
Cast steel	40.00
Uncut tires	39.00
Angles, splice bars	42.00
Rails, rerolling	44.00

LOS ANGELES

No. 1 heavy melting	24.00
No. 2 heavy melting	20.00
No. 1 bundles	23.00
No. 2 bundles	20.00
Machine shop turnings	8.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	37.00-40.00

HAMILTON, ONT.

(Delivered prices)

Heavy melting	$32.50
No. 1 bundles	32.50
No. 2 bundles	32.50
Mechanical bundles	28.50
Mixed steel scrap	28.50
Mixed borings, turnings	26.50
Rails, remelting	32.50
Rails, rerolling	41.50
Busheling	26.50
Busheling new factory:	
Prep'd	30.50
Unprep'd	28.50
Short steel turnings	22.50

Cast Iron Grades

No. 1 machinery cast	46.00-50.00

†F.o.b., shipping point.

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1.	1	¼" x 5⅝"	16'	1020
2.	2½	¼" x 1"	18-20'	1050
3.	10	¼" x 2"	16-20'	Mild
4.	6	¼" x 4"	20'	Mild
5.	9	5/16" x ⅜"	15'10"	1035
6.	2	⅜" x 1½"	13'4"	1065
7.	3½	⅜" x 2"	16-20'	Mild
8.	7	½" x 1½"	10-16'	Mild
9.	5	½" x 2"	16-20'	Mild
10.	25	½" x 2½"	10'1"	1020*
11.	3	½" x 2½"	12-16'	1050
12.	8½	⅝" x 2½"	20'	Mild
13.	10	⅝" x 3"	10-12'	Mild
14.	9	⅝" x 3½"	14-18'	Mild
15.	45	⅝" x 4"	16-20'	Mild
16.	3	¾" x 3½"	16'	Mild
17.	10	⅞" x 2½"	16'5"	Mild
18.	3	1" x 1½"	16'	1020
19.	4	1" x 2"	20-24'	Mild
20.	2½	1" x 4½"	5-9'	1020
21.	1	2" x 3"	20'	Mild

HOT ROLLED MILD STEEL ANGLES

Item	Tons	Size	Length	Qual.
22.	20	1⅛" x 1⅛" x ⅛"	20'	
23.	16	1½" x 1½" x 5/16"	30'	
24.	19	1⅜" x 1⅜" x ⅜"	20'	
25.	20	2" x 1½" x ⅛"	16-20'	
26.	15	2½" x 2½" x ¼"	18-20'	
27.	40	4" x 3" x ⅜"	30'	

HOT ROLLED MILD STEEL STRIP

28.	16	⅛" x 1¾"	12-16'
29.	28	3/16" x 1"	12'8"-25'4"
30.	3½	3/16" x 1¾"	12'
31.	60	3/16" x 2¼"	20-24'
32.	15	3/16" x 2½"	13'8"
33.	4	3/16" x 7"	12'

HOT ROLLED ROUNDS

34.	5	½"	x 12-14'	TS4140
35.	4	11/16"	x 16-20'	C1040
36.	21	¾"	x 18-20'	C1137

*Denotes pickled and oiled

HOT ROLLED ROUNDS

Item	Tons	Size	Length	Qual.
37.	2	⅞"	x 17'4"	C1010
38.	17	1"	x 16'	A5140
39.	35	1¼"	x 10-12'	A4027
40.	5	1⅜"	x 16-20'	C1042
41.	17	1½"	x 16-20'	C1035
42.	3½	1⅝"	x 20-24'	46B12
43.	45	1¾"	x 10-22'	C1035
44.	24	1¾"	x 14-16'	C1045
45.	6½	1¾"	x 4-6'	TS8640
46.	14	1¾"	x 14-18'	C1025
47.	10	2"	x 16-20'	A8620
48.	3½	2⅛"	x 16-18'	80B25
49.	2½	2⅛"	x 17'4"	94B20
50.	5	2¼"	x 14-16'	TS8140
51.	2	2½"	x 18'	A5145
52.	5	2½"	x 16-20'	A8620
53.	44	2 3/8"	x 10-12'	TS4145
54.	10	3"	x 16-20'	A8620
55.	4½	3 1/16"	x 16-20'	TS8123
56.	9	3⅛"	x 19'8"	94B17
57.	2	3 1/8"	x 16-20'	C1045

MILL PRICE PLUS HANDLING COST
For Letter or Telegraphic Brevity—Refer to Item Numbers.

SPECIALISTS in SURPLUS STEEL INVENTORIES
BILLETS • PLATES • BARS • SHEETS • BANDS • STRUCTURALS • STRIP • WIRE
"Be Weiss — Buy Weiss" *34 years of Steel Service* "Be Weiss — Sell Weiss"

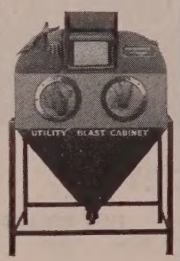
PANGBORN
BLAST CLEANING
GIVES YOU FASTER, CHEAPER MAINTENANCE

Either a Portable Unit to Clean Structures...

Pangborn Blast Cleaning Machine—Cleans tanks, bridges, buildings, and other structures quickly and economically. Ideal for maintenance and other jobs, such as removal of dirt, scale, rust, etc. preparatory to painting. Six sizes, stationary or portable, from . . . **$188** and up.

Or a Compact Cabinet for Small Pieces

Pangborn Blast Cabinet—Saves time and money in cleaning small metal parts . . . removing rust, scale, grime, old paint, etc. Produces smooth, clean surfaces on pieces up to 60″ x 35″ in size. Models from . . . **$319** and up.



Pangborn Unit Dust Collectors—Trap dust at the source. Minimize maintenance, allow reclamation of valuable material . . . **$286** and up.

Pangborn Hydro-Finish Cabinets—Remove directional grinding lines, hold tolerances to .0001″. Reduce further finishing of tools, molds, dies . . . **$1410** and up.

Write for details on these machines to: PANGBORN CORPORATION, 1600 Pangborn Blvd., Hagerstown, Md.

Look to Pangborn for the latest developments in Blast Cleaning and Dust Control equipment.

Pangborn

BLAST CLEANS CHEAPER

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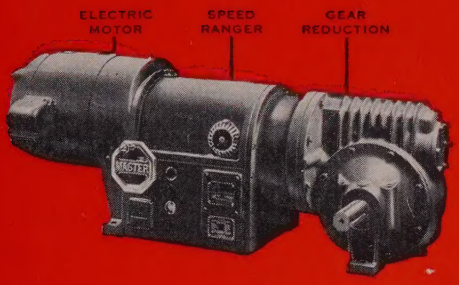
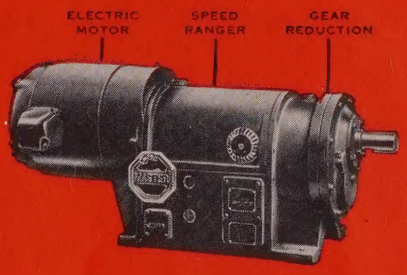




Don't put up with make-shift assemblies when it is so easy to get the RIGHT horsepower, the RIGHT shaft speed, the RIGHT construction features, the RIGHT mounting . . . all combined into one compact power package.

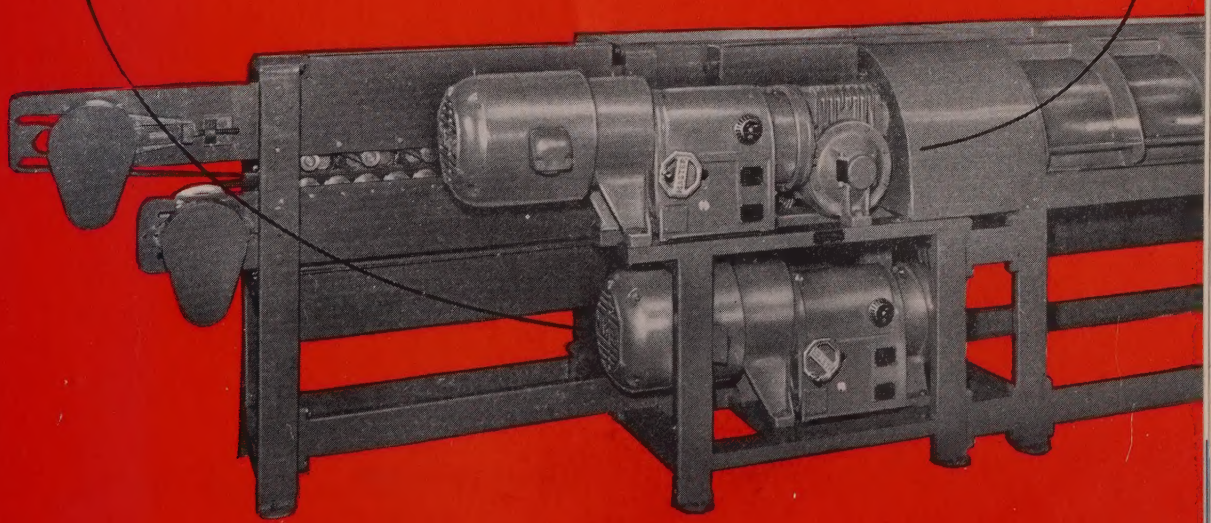
Master Motors are available in thousands on thousands of types and ratings (up to 400 HP) giving you a selection you can get nowhere else. This permits you to choose a power drive for each job that's just right . . . a power drive that will add greatly to the compactness, appearance, safety, and economy of each of your motor applications.

See how the designer of this tobacco processing machine has used two different Master units that are just right for his purpose . . . one, a motor with a variable speed unit and a right angle worm gear, the other a motor with a variable speed unit and a parallel shaft gear reduction unit.

you can always be right

Select the RIGHT power drive from Master's broad line and you can increase the saleability of your motor-driven products . . . improve the economy and productivity of your plant equipment. That's the horsesense way to use horsepower.

THE MASTER ELECTRIC COMPANY • DAYTON, OHIO



Beam mill idler rolls stay free-running on TIMKEN® bearings

THIS wide flange beam mill, in operation at a large eastern steel plant rolls beams ranging from 5″ to 36″ deep, with flanges from 4″ to 16″ wide, and weighing 8½ to 426 pounds a lineal foot.

The vertical rolls that work on the outside of the flanges are idlers. To keep them free-running, they were mounted on Timken® tapered roller bearings.

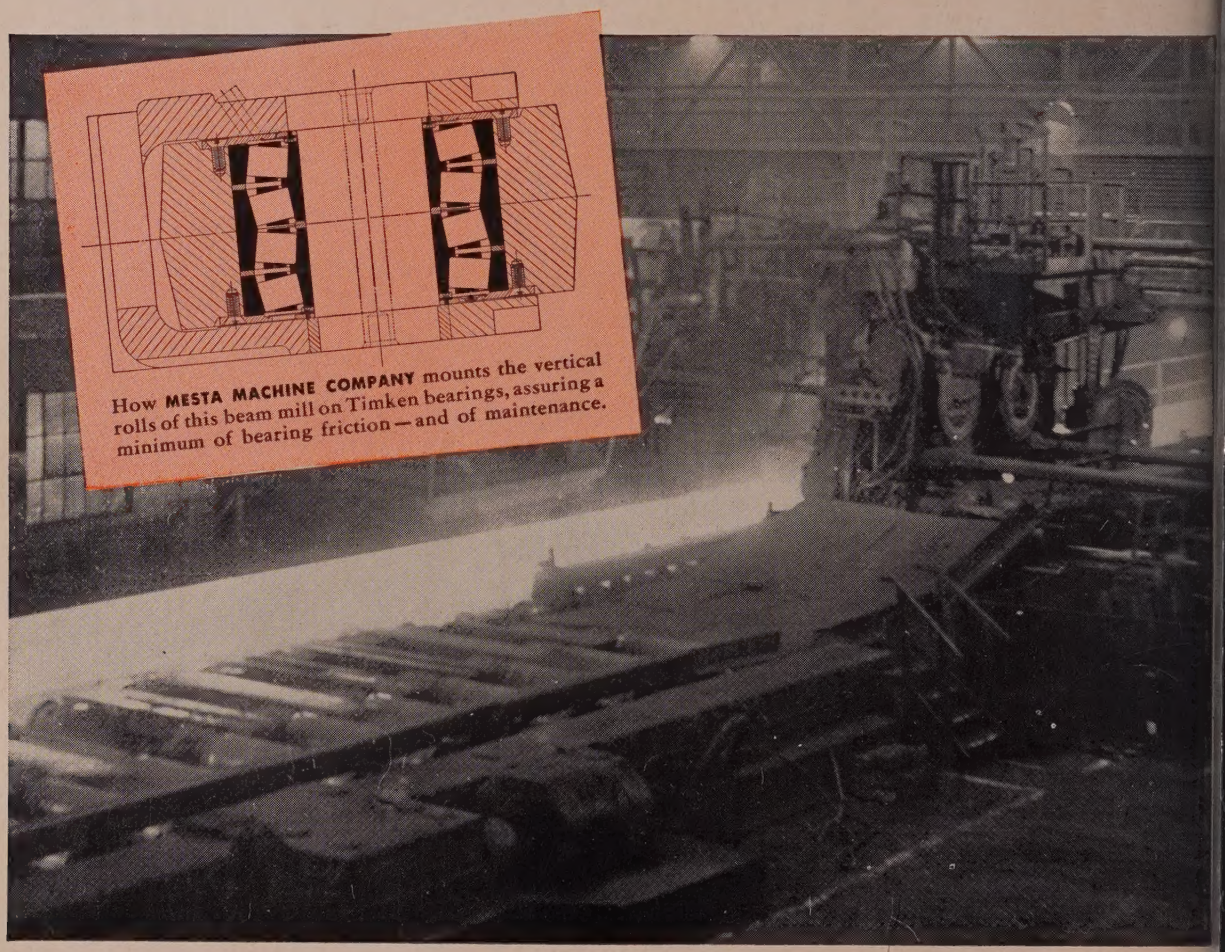
This permits the rolls to start smoothly and easily, even under full load. Timken bearings' true rolling motion and incredibly smooth surface finish practically eliminate bearing friction.

No extra thrust units are needed on these rolls. The Timken bearings, being *tapered,* can take radial *and* thrust loads in any combination. And they have great resistance to shocks. Timken bearing rollers and races are case hardened, with a hard, wear-resisting surface, and a tough, shock-resisting core.

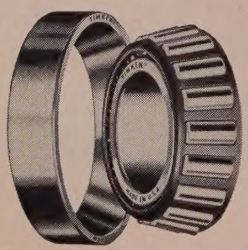
Tonnage records indicate that the long life of Timken bearings gives lowest bearing cost per ton of steel rolled. Consult our roll neck specialists for full details. Write: The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO".

TIMKEN BEARING EQUIPPED

This symbol on a product means its bearings are the best.



How **MESTA MACHINE COMPANY** mounts the vertical rolls of this beam mill on Timken bearings, assuring a minimum of bearing friction—and of maintenance.



TIMKEN

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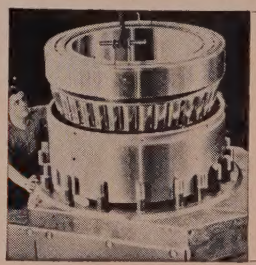
TAPERED ROLLER BEARINGS



ROLL NECK BEARING ENGINEERING SERVICE

Our field and service engineers have had years of experience with problems of roll neck bearing design and operation. They'll help you select bearings and design mountings.

The Timken Roller Bearing Company is the acknowledged leader in: 1. advanced design; 2. precision manufacture; 3. rigid quality control; 4. special analysis Timken steels.